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The Braconidae (Hymenoptera) of Taiwan

V. Cardiochilinae and Orgilinae[1]

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Abstract : Five species of Cardiochilinae and 18 species of Orgilinae from Taiwan are recognized in this paper. Among them, 14 species are new to science and 2 species are new to the fauna of Taiwan. Keys to the Taiwanese genera and species of the subfamilies Cardiochilinae and Orgilinae are also presented.

Key words : Cardiochilinae, Orgilinae, Braconidae, Taxonomy, Taiwan.

INTRODUCTION

The subfamily Cardiochilinae contains about 165 species in the world, including 5 species in Taiwan. They are endoparasitoids of larvae of Pyralidae, Noctuidae, Cosmopterigidae, Gelechiidae, Tortricidae and Epiplemidae[11]

The subfamily Orgilinae contains about 275 species worldwide, including 3 species in Taiwan. They are endoparasitoids of larvae of Pyralidae, Tortricidae, Coleophoridae, Gelechiidae, Oecophoridae and Gracillariidae[1]. Eighteen species of this subfamily from Taiwan are recognized in this paper, of which 14 species are new to science.

Van Achterberg[4] provided key to distinguish the subfamilies Cardiochilinae and Orgilinae from the other Braconidae. The terminology used here mainly follow Huber and Sharkey[12], Wahl and Sharkey[16] and van Achterberg[2]. Others are defined here. The letter OD is the greatest diameter of a posterior ocellus. The tentorial index is tentorio-ocular line over intertentorial line. The specimens used in this study are deposited in the Insect Collection of the Taiwan Agricultural Research Institute, Taichung, Taiwan, R.O.C.

The following abbreviations of collectors are used in the specimens examined: CCC (C. C. Chen), CCCh (C.C. Chien), CCP (C.C. Pan), CHW (C.H. Wang), CHY(C.H. Yang), CJL (C.J. Lee), CNL (C.N. Lin), JS (J. Sonan), KCC (K.C. Chou), KSL(K.S. Lin), LYC (L.Y. Chou), SCL (S.C. Lin), SPH (S.P. Huang), TL (T. Lin), WST (W.S. Tang).

The county and altitudes of the localities which occur in the text are as follows: CHIAYI: Chiayi, Chuchi, Meishan.

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HSINCHU: Wufeng 400m.
HUALIEN: Fuli, Tayuling 2560m.
ILAN: Shuiyuan.
KAOHSIUNG: Chiasien, Chihshan, Liukuei, Maolin.
NANTOU: Lienhuachih 650m, Lushan 1000m, Meifeng 2150m, Sungkang 2100m, Sunmoonlake, Tsuifeng 2300m, Tungpu 1200m, Wushe 1150m.
PINGTUNG: Chaochou, Kenting, Ouluanpi, Shantimen.
TAICHUNG: Wanfeng, Wuling 1900m.
TAINAN: Tainan.
TAIPEI: Chutzuhu, Taipei.
TAITUNG: Chengkung, Chihpen, Tawu, Tungho.
TAOYUAN: Fuhsing.
YUNLIN: Hsilo.

Subfamily CARDIOCHILINAE

The Cardiochilinae are characterized by the following combination of characters: occipital carina absent, vein 4/Rs of fore wing weakly sclerotized and decurved, cell 1+2Rs of fore wing present and distinctly wider than long; and first metasomal tergum with spiracle on laterotergite. This subfamily consist of 6 genera[10,14]. Two genera, *Cardiochiles* Nees and *Hartemita* Cameron, have been known to occur in Taiwan.

Key to genera of Cardiochilinae from Taiwan

1. Eye setose; hind basitarsus tubular; ovipositor sheath distinctly longer than half length of hind basitarsus ..... *Cardiochiles* Nees
2. Eye bare; hind basitarsus flattened or laminate; ovipositor sheath shorter than half length of hind basitarsus ..... *Hartemita* Cameron

Genus *Cardiochiles* Nees

Cardiochiles Nees, 1818. Nova Acta Acad. nat. Curios. 9:307, no species. Type pecies: *Ichneumon saltator* Fabricius, first included species, Nees, 1834. - Nees, 1834. Hym. Ichn. affin. Mon. 1:224. - Sharkey & Mason, 1986. Proc. Entomol. Soc. Wash. 88(2):301.

Helcon (*Cardiochiles*): Haliday, 1835. Ent. Mag. 3:145.

Toxoneuron Say, 1836. Boston J. nat. Hist. 1:258. Type species: *Bracon* (*Toxoneuron*) *viator* Say, by subsequent designation, designated by Viereck, 1914. - Viereck, 1914. Bull. U.S. natn. Mus. 83:146.

Tenthredoides Cresson, 1865. Proc. ent. Soc. Philad. 4:290. Type species: *Tenthredoides seminiger* Cresson, by monotypy.

Ditherus Cameron, 1902. J. Bombay nat. Hist. Soc. 14:434. Type species: *Ditherus ruficollis* Camaron, by monotypy.

Schonlandella Cameron, 1904. Rec. Albany Mus. 1:169. Type species: *Schonlandella nigromaculata* Cameron, by subsequent designation, designated by Viereck, 1914. -

Viereck, 1914. Bull. U.S. natn. Mus. 83:132.

Ernestiella Cameron, 1905. Spolia zeylan. 3:81. Type species: *Ernestiella nigromaculata* Cameron, by monotypy.

Psilommiscus Enderlein, 1912. Arch. Naturgesch. 78A:98. Type species: *Psilommiscus sumatranus* Enderlein, by monotypy.

Asiacardiochiles Telenga, 1955. Fauna SSSR 5(4):236. Type species: *Asiacardiochiles mimutus* Telenga.

The genus *Cardiochiles* is characterized by the following combination of characters: eye setose; cell 1M of fore wing elongate; hind basitarsus tubular or at most slightly flattened; hypopygium usually pointed posteriorly; ovipositor and ovipositor sheath usually reaching well beyond apex of metasoma, straight or evenly curved throughout their length. It contains about 150 species in the world, including 3 species in Taiwan[18].

Key to species of the genus Cardiochiles from Taiwan

1. Head and notauli smooth 2
-. Head partly rugose, notauli crenulate ..... *albopilosus* Szépligeti
2. Body reddish yellow; stigma brown to dark brown, lighter basally ..... *szepligeti* Enderlein
-. Body black; stigma dark brown entirely ..... *laevifossa* Enderlein

Cardiochiles albopilosus Szépligeti

Cardiochiles albopilosus Szépligeti, 1902. Természetr. Füz. 25:78. - Watanabe, 1934. Insecta matsum. 8(4):204. - Watanabe, 1937. J. Fac. Agric. Hokkaido (imp.) Univ. 42(1):144.

Specimen examined: Specimen was not available to study.
Distribution: Singapore, Sumatra and Taiwan.
Host: Unknown.

Cardiochiles laevifossa Enderlein (Fig. 1)

Cardiochiles laevifossa Enderlein, 1906. Stettin. ent. Ztg. 67:248. - Watanabe, 1934. Insecta matsum. 8(4):204. - Watanabe, 1937. J. Fac. Agric. Hokkaido (imp.) Univ. 42(1):144.

Specimens examined: Chaochou, 3♀,3♂,26.III.1982; 10♀,2♂, 7.IV.1982 ex. *Cnaphalocrocis medinalis* on rice (CCC). Chengkung, 12♀,23♂, 16-17.IX.1982 (KCC & CNL). Chihshan, 3♂, 25.III.1982 (KCC & CCP). Hsilo, 1♀,1♂, 8.X.1981 ex. *Cnaphalocrocis medinalis* on rice (CCC). Fuli-Tungho, 2♀, 9-11.XI.1982 (KCC & SPH). Liukuei, 1♂, 27-28. VI.1981 (LYC & CHY). Kenting, 1♂, 25-28.V.1982 (KCC & CCP); 2♂, 2-6.VIII.1982 (KCC & CNL). Maolin, 1♂, 26.III.1982 (KCC & CCP). Ouluanpi, 1♀, 25-28.V.1982 (KCC & CCP); 2♂, 5.VIII.1982 (KCC & CNL); 2♂, 12-16.III.1984 (KCC & CCP). Taipei, 2♀, 4♂ VII.1971 (KSL); 1♀, 1♂,2. X.1972 (KSL); 4♀, VIII.1975 (KSL); 1♂, X.1975 (KSL). Wanfeng, 46♀, 20♂, VII-X.1984 (

KSL & KCC); Wushe, 2♂, 14.VII.1982 (SCL & CNL).

Distribution: Java and Taiwan.

Host: *Cnaphalocrocis medinalis* (Guenée)[7,8].

Cardiochiles szepligeti Enderlein (Fig. 2).

Cardiochiles szepligeti Enderlein, 1906. Stettin. ent. Ztg. 67:252. - Watanabe, 1934. Insecta matsum. 8(4):205. - Watanabe, 1937. J. Fac. Agric. Hokkaido (imp.) Univ. 42(1):144.

Cardiochiles testaceus Szépligeti, 1902. Természetr. Füz. 25:77 (not Kriechbaumer, 1894).

Specimens examined: Chiasien, 1♂, 10-13.V.1981 (CCC & CCP). Liukuei, 1♀, 27-28.VI. 1981 (LYC & CHY). Meishan, 3♀,2♂, 29-30.1X.1967 (KCC). Wanfeng, 4♀,7♂, VII-VIII. 1984 (KSL & KCC). Wufeng, 2♂, 14-16.VII.1982 (KCC & CCP).

Distribution: Java, Malaysia, Singapore, Sri Lanka and Taiwan.

Host: Unknown.

Genus *Hartemita* Cameron

Hartemita Cameron, 1910. Wien. ent. Ztg. 29:99. Tye species: *Hartemita latipes* Cameron, by monotypy. - Dangerfield & Austin, 1990. J. Nat. Hist. 24:138.

Laminitarsus Fullaway, 1919. J. Straits Brch R. Asiat. Soc. 80:57. Type species: *Laminitarsus muirii* Fullaway, by monotypy.

The genus *Hartemita* is characterized by the following combination of characters: eyes mostly bare; cell 1M of fore wing equidimensional in shape; hind basitarsus flattened or laminate; hypopygium broadly rounded posteriorly; ovipositor very short and strongly down-curved; ovipositor sheath very short and directed ventrally. It contains 9 species in the world, including 2 species in Taiwan[10].

Key to species of the genus *Hartemita* form Taiwan

1. Hind basitarsus flattened, 3.7-3.9 times as long as wide, no wider than distal part of hind tibia; vertex largely smooth ..... *latipes* Cameron

-. Hind basitarsus broadly laminate, about 2.9 times as long as wide, distinctly wider than distal part of hind tibia; vertex weakly strigate medially ..... *townesi* Dangerfield & Austin

Hartemita latipes Cameron (Fig. 3)

Hartemita latipes Cameron, 1910. Wien. ent. Ztg. 29:99. - Dangerfield & Austin, 1990. J. Nat. Hist. 24:141.

Cardiochiles latipes (Cameron): Mao, 1949. Proc. U.S. natn. Mus. 99:230.

Specimens examined: Lienhuachih, 2♂, IX.1984 (KSL & KCC). Shuiyuan, 1♀, 12.VII. 1939 (JS). Sunmoon lake, 1♂, 20-27.IV.1970 (malaise trap). Tungpu, 1♀, X.1985 (KSL).

Distribution: Nepal and Taiwan.

Host: Unknown.

Hartemita townesi Dangerfield & Austin (Fig. 4)

Hartemita townesi Dangerfield & Austin, 1990. J. Nat. Hist. 24:150.

Specimen examined: Lienhuachih, 1♂, IX.1984 (KSL & KCC).

Distribution: Nepal, Sumatra and Taiwan.

Host: Unknown.

Subfamily ORGILINAE

The Orgilinae are characterized by the following combination of characters: occipital carina usually present; without vein fold between vein 1/Rs and stigma; vein r-m of fore wing usually absent, if present, then cell 1+2Rs triangular (except *Antestrix* van Achterberg); fore wing without anal crossvein; vein 2cu-a of fore wing present; metatibia with apical pegs or spines; dorsope absent. This subfamily consist of 3 tribes, 11 genera[1,3,5,6,15]. Only the genus *Stantonia* Ashmead has been known to occur in Taiwan. In this paper 2 genera, *Orgilonia* van Achterberg and *Orgilus* Haliday, are added to the fauna of Taiwan.

Key to tribes and genera of Orgilinae from Taiwan

1. Vein r-m of fore wing present or absent; vein M+Cu of hind wing much shorter than vein 1/M; posterior margin of hind wing concave subbasally (Figs. 5-7) ..... Tribe Mimagathidini, 2
-. Vein r-m of fore wing absent; vein M+Cu of hind wing subequal to vein 1/M or longer; posterior margin of hind wing convex or nearly straight subbasally (Figs. 8-21) ..... Tribe Orgilini, *Orgilus* Haliday
2. Occipital carina absent; vein r-m of fore wing absent (Fig. 7) ... *Orgilonia* van Achtereng
-. Occipital carina reaching upper level of eye; vein r-m of fore wing present (Figs. 5-6) ..... *Stantonia* Ashmead

Tribe Mimagathidini Enderlein

The tribe Mimagathidini is characterized by the following combination of characters: vein r-m of fore wing present, reduced to unsclerotized vein or absent; vein M+Cu of hind wing much shorter than vein 1/M; vein Cu&cu-a of hind wing strongly reclivous; posterior margin of hind wing concave subbasally. It consists of 3 genera, *Bentonia* van Achterberg, *Orgilonia* van Achterberg and *Stantonia* Ashmead. The latter two genera occur in Taiwan.

Genus Orgilonia van Achterberg

Orgilonia van Achterberg, 1987. Zool. Verh. Leiden 242:13. Type species: *Orgilonia fuscistigma* van Achterberg, by original designation.

The genus *Orgilonia* is characterized by the following combination of characters: occipital carina absent or only up to middle level of eye; vein r-m of fore wing absent; third and fourth metasomal terga with sharp lateral crease. It contains 4 species in the world. In this paper one new species is described from Taiwan.

Orgilonia chuchiensis sp. n.
(Fig. 7)

Orgilus sp. Chiu, Chou and Chou. 1981. J. Agric. Res. China 30(4):423.

Female: Head: 1.8 times as wide as long and 1.5 times wider than mesonotum. Eye 4.8 times as long as temple in dorsal view, eye height 1.4 times eye length in lateral view. Temples coriaceous; gradually narrow behind eyes. Frons granulate-coriaceous; glabrate medially. POL: OD: OOL=1: 0.86: 1.6. Vertex granulate-coriaceous. Face and clypeus combined 0.97 times as high as wide and 0.94 times as wide as eye height and 0.54 times as wide as head; face coriaceous; clypeus slightly coriaceous. Tentorial index 0.75. Malar space 1.1 times basal width of mandible and 0.26 times eye height. Length of maxillary palp 1.6 times height of head. Remaining antennal segments 30; first flagellomere 1.2 times as long as second; length of first and second flagellomeres 4.2 and 3.4 times their width, respectively.

Mesosoma: 1.8 times as long as high; largely granulate-coriaceous. Pronotal side crenulate medio-anteriorly. Notauli deep, crenulate. Epicnemial carina lightly indicated and not reaching anterior margin of mesopleuron; precoxal sulcus absent anteriorly, shallowly impressed posteriorly.

Wings: Fore wing: Stigma 4.8 times as long as wide; basal posterior section of stigma 1.1 times apical posterior section of stigma; r-rs: 3+4/Rs: 2/Rs=1: 9.2: 1.9; r-rs 0.87 times as long as stigma width; length of vein R1 9.0 times fore wing length from apex of cell 2Rl to wing apex; 2+3/M absent; lcu-a almost interstitial. Hind wing 8.2 times as long as wide.

Hind leg: Coxa granulate-coriaceous. Length of femur, tibia and basitarsus about 5.5, 12.9 and 9.6 times their width, respectively; tibial spurs 0.40 and 0.27 times as long as basitarsus.

Metasoma: First tergum 2.3 times as long as wide apically, dorsal carinae absent; second and third terga combined 2.4 times as long as wide at second metasomal suture; second metasomal suture wide and weakly crenulate. Basal four terga densely reticulate-punctate; rest terga coriaceous. Second, third and anterior fouth terga with sharp lateral crease. Ovipositor sheath 1.8 times as long as fore wing and 5.5 times as long as metafemur.

Color: Dark brown; clypeus ventrally and tegula brownish yellow, mandible (except for dark brown apex) and palpi yellow, anterior margins of basal three metasomal terga, lateral

and apical margins of second metasomal tergum yellow to brownish yellow. Antenna dark brown; scape, pedicel and flagellomeres 9-12 brownish yellow. Wings hyaline; stigma and veins dark brown. Legs largely brownish yellow. Ovipositor sheath dark brown.

Length: Body 4.8 mm, antenna 4.1 mm, fore wing 3.3 mm, ovipositor sheath 6.0 mm.

Male: Unknown.

Specimen examined: Holotype ♀, Chuchi, 21.X.1978 (LYC).

Distribution: Taiwan.

Host: Reared from unknown host which associated with lac sticks[9].

Remarks: This species is characterized by the following combination of characters: occipital carina completely absent; basal four metasomal terga densely reticulate-punctate; first metasomal tergum 2.3 times as long as wide apically, dorsal carinae absent; ovipositor sheath 1.8 times as long as fore wing.

Etymology: Named for the type locality, Chuchi.

Genus *Stantonia* Ashmead

Stantonia Ashmead, 1904. Proc. U.S. natn. Mus. 28:146. Type species: *Stantonia flava* Ashmead, by monotypy. - van Achterberg, 1987. Zool. Verh. Leiden 242:20.

Mimagathis Enderlein, 1905. Zool. Anz. 28:450. Type species: *Mimagathis ashmeadi* Enderlein, by subsequent designation, designated by Viereck, 1914. - Viereck, 1914. Bull. U.S. natn. Mus. 83:95.

The genus *Stantonia* is characterized by the following combination of characters: occipital carina lamelliform, reaching upper level of eye; scutellum evenly convex; vein r-m of fore wing usually present; third and fourth metasomal terga without sharp lateral crease. It contains about 40 species in the world, including 2 species in Taiwan[17]. In this paper one species, *Stantonia ruficornis* Enderlein, is added to the fauna of Taiwan.

Key to species of the genus *Stantonia* from Taiwan

1. Vein r-m of fore wing curved outwardly, but not bent 2
-. Vein r-m of fore wing bent at upper third ..... *sauteri* Watanabe
2. Ovipositor sheath 0.52-0.58 times as long as fore wing length; propodeum coarsely rugose posteriorly; tegula brownish yellow; mesoscutum without dark brown pattern ..... *issikii* Watanabe
-. Ovipositor sheath 0.17-0.19 times as long as fore wing length; propodeum largely smooth to with some weaker rugae; tegula almost always dark brown apically; mesoscutum almost always with dark brown pattern ..... *ruficornis* Enderlein

Stantonia issikii Watanabe
(Fig. 5)

Stantonia issikii Watanabe, 1932. Insecta matsum. 6(4):187. - van Achterberg, 1987. Zool. Verh. Leiden 242:22

Microtypus issikii (Watanabe): Watanabe, 1937. J. Fac. Agric. Hokkaido (imp.) Univ. 42(1):95.

Specimens examined: Lienhuachih, 1♀, IX.1984 (KSL & KCC); 1♀, XII.1984 (KSL & KCC). Tainan 1♀, 18.VII.1935 (JS). Wanfeng, 1♀, XI.1984 (KSL & KCC).

Distribution: Taiwan.

Host: Unknown.

Stantonia ruficornis Enderlein
(Fig. 6)

Stantonia ruficornis Enderlein, 1921. Wien. ent. Ztg. 38:58. - van Achterberg, 1987. Zool. Verh. Leiden 242:24.

Specimens examined: Meifeng, 1♂, 4-7.X.1982 (KCC). Tungpu, 1♀, 25-29.IX.1980 (LYC & TL); 1♂, 22-25.XI.1982 (KCC & SPH) ; 1♀, 10-14.I.1983 (KCC & SPH); 6♀, X-XII.1985 (KSL).

Distribution: Mainland China, Taiwan (new record)and Viet Nam.

Host: Unknown.

Stantonia sauteri Watanabe

Stantonia sauteri Watanabe, 1932. Insecta matsum. 6(4):188. - van Achtergerg, 1987. Zool. Verh. Leiden 242:24.

Microtypus sauteri (Watanabe): Watanabe, 1937. J. Fac. Agic. Hokkaido (imp.) Univ. 42(1):95.

Specimen examined: Specimen was not available to study.

Distribution: Taiwan.

Host: Unknown.

Tribe Orgilini Ashmead

The tribe Orgilini is characterized by the following combination of characters: vein r-m of fore wing usually absent; vein M+Cu of hind wing subequal to vein 1/M or longer; vein Cu&cu-a of hind wing usually vertical or weakly reclivous; posterior margin of hind wing nearly straight or convex subbasally. It consists of 7 genera[1,5,6]. Only the genus *Orgilus* Haliday occurs in Taiwan.

Genus *Orgilus* Haliday

Orgilus Haliday, 1833. Ent. Mag. 1:262. Type species: *Microdus obscurator* Nees, by monotypy. - van Achterberg, 1987. Zool. Verh. Leiden 242:55. - Taeger, 1989. Akad. Landwirtschaftswiss. DDR :24.

Ischius Wesmael, 1837. Nouv. Mem. Acad. Brux. 10:20. Type species: *Microdus obscurator*

Nees, by subsequent designation, designated by Viereck, 1914. - Viereck, 1914. Bull. U. S. natn. Mus. 83:77.

Macropalpus Ratzeburg, 1844. Ichn. d. Forstins. 1:56. Type species: *Eubadizon leptocephalus* Hartig, by monotypy.

Oresimus Ashmead, 1900. Proc. U.S. natn. Mus. 23:123. Type species: *Eubadizon maculiventris* Cresson, by monotypy.

Orgilomorpha Ashmead, 1900. Proc. U.S. nstn. Mus. 23:123. Type species: *Ganychorus gelechiae* Ashmead, by monotypy.

Orgilus (*Ischiolus*) Hellén, 1958. Soc. Fauna Flora Fennica 4:34. Type species: *Microgaster rugosus* Nees, by monotypy. - van Achterberg, 1987. Zool. Verh. Leiden 242:55.

The genus *Orgilus* is characterized by the following combination of characters: clypeus without tubercles; stemmaticum situated in a largely flat or convex area; scutellum without depression medio-posteriorly; vein 1/Rs of fore wing absent; first metasomal tergum (sub)-sessile and usually concave basally; second and third metasomal terga without X-shaped depression. It consists of 4 subgenera[15], and about 220 species in the world. In this paper 13 new species are described from Taiwan. All of these species belong to the subgenus *Orgilus* Haliday. The subgenus *Orgilus* is characterized by the epicnemial carina present; and occipital carina present laterally, at least as a short stub.

Key to species of the genus *Orgilus* from Taiwan

1. Vein 2+3/M of fore wing subequal to 2/Rs+M, or longer (Figs. 8-13); malar space 1.3-2.4 times basal width of mandible 2
-. Vein 2+3/M of fore wing wanting or short, usually at most about 0.5 times as long as 2/Rs+M (Figs. 14-21); malar space 0.9-1.1 times basal width of mandible 7
2. Face and clypeus combined 1.4-1.5 times as high as wide; malar space 1.9-2.4 times basal width of mandible 3
-. Face and clypeus combined 1.0-1.1 times as high as wide; malar space 0.88-1.6 times basal width of mandible 4
3. Third metasomal tergum largely rugose-reticulate; tentorial index 0.36-0.38 ..... *parapappianus* sp. n.
-. Third metasomal tergum at least largely smooth medially; tentorial index 0.46-0.58 ..... *caballus* sp. n.
4. Ovipositor sheath almost as long as fore wing length; antenna 40-segmented; second and third metasomal terga combined 1.6 times as long as wide at second metasomal suture ..... *amplissimus* sp. n.
-. Ovipositor sheath about 0.42-0.73 times as long as fore wing length; antenna 29-30-segmented; second and third metasomal terga combined 1.2-1.3 times as long as wide at second metasomal suture 5
5. Third metasomal tergum closely punctate anteriorly; mesosoma 1.8 times as long as high; mesopleuron largely coriaceous-granulate ..... *ischnus* Marshall

-. Third metasomal tergum largely smooth; mesosoma 1.4-1.6 times as long as high; mesopleuron punctulate 6
6. Second metasomal tergum densely punctate anteriorly; ovipositor sheath about 0.72 times as long as fore wing length ..... *taiwanensis* sp. n.
-. Second metasomal tergum only with few small punctures; ovipositor sheath about 0.42 times as long as fore wing length ..... *planus* sp. n.
7. Head densely punctulate or punctate; second metasomal tergum reticulate-rugose or costate 8
-. Head coriaceous or granulate-coriaceous; second metasomal tergum closely punctate or punctate-reticulate 10
8. Third metasomal tergum with complete sharp lateral crease ..... *cunctus* sp. n.
-. Third metasomal tergum without complete sharp lateral crease, absent apically..... 9
9. Ovipositor sheath 1.2-1.3 times as long as fore wing length; first metasomal tergum 1.3-1.5 times as long as wide apically ..... *rarus* sp. n.
-. Ovipositor sheath 0.59-0.63 times as long as fore wing length; first metasomal tergum almost as long as wide apically..... *improcerus* sp. n.
10. Antenna 21-25-segmented; tentorial index 0.89-1.0; length of vein R1 4.9-5.2 times fore wing length from apex of cell 2R1 to wing apex ..... *galbinus* sp. n.
-. Antenna 29-33-segmented; tentorial index 0.58-0.77; length of vein R1 9.2-10.2 times fore wing length from apex of cell 2R1 to wing apex 11
11. Dorsal surface of head, mesosoma and metasoma largely blackish brown to black 12
-. Dorsal surface of head, mesosoma and metasoma largely brownish yellow 13
12. Second and third metasomal terga combined 0.87 times as long as wide at second metasomal suture; mesosoma 1.4 times as long as high; antenna 29-segmented .....
..... *lini* sp. n.
-. Second and third metasomal terga combined 1.2 times as long as wide at second metasomal suture; mesosoma 1.7 times as long as high; antenna 33-segmented .....
..... *cretus* sp. n.
13. First metasomal tergum largely glabrous between dorsal carinae; basal posterior section of stigma 1.6 times apical posterior section of stigma; fore wing vein r-rs: 3+4/Rs: 2/Rs about 1: 8.6: 2.4;..... *meifengensis* sp. n.
-. First metasomal tergum largely sculptured between dorsal carinae; basal posterior section of stigma 1.3-1.4 times apical posterior section of stigma; fore wing vein r-rs: 3+4/Rs: 2/Rs about 1: 6.8: 1.9; ..... *caritus* sp. n.

Orgilus amplissimus sp. n.

(Figs. 8, 23, 38, 52, 66, 80, 96, 111, 124, 149)

Female: Head: 1.5 times as wide as long and 1.2 times wider than mesonotum. Eye 1.4 times as long as temple in dorsal view, eye height 1.7 times eye length in lateral view. Temple densely punctate. Frons strigate medioventrally, smooth mediodorsally, densely punctate laterally. POL: OD: OOL=1: 0.80: 1.7. Vertex densely punctate. Face and clypeus combined

1.0 times as high as wide and 1.2 times as wide as eye height and 0.61 times as wide as head; convex, densely punctate. Tentorial index 0.52. Malar space 1.4 times basal width of mandible and 0.44 times eye height. Length of maxillary palp 1.1 times height of head. Antenna 40-segmentde; first flagellomere 1.4 times as long as second; length of first, second and penultimate flagellomeres 2.6, 1.8 and 0.88 times their width, respectively.

Mesosoma: 1.6 times as long as high. Pronotal side rather densely punctulate dorsally; reticulate-rugose medially; densely punctulate ventrally. Notauli well impressed, crenulate; mesoscutum densely punctate, scutellum rather densely punctulate. Mesopleuron rather densely punctulate above precoxal sulcus, densely punctulate below precoxal sulcus; precoxal sulcus crenulate. Metapleuron rather densely punctate, rugose ventrally. Propodeum largely rugose-reticulate, smooth anterolaterally.

Wings: Fore wing: Stigma 4.1 times as long as wide; basal posterior section of stigma 1.4 times apical posterior section of stigma; r-rs: 3+4/Rs: 2/Rs=1: 4.8: 1.6; r-rs 1.2 times as long as stigma width; length of vein R1 2.3 times fore wing length from apex of cell 2R1 to wing apex; 2+3/M 1.6 times as long as 2/Rs+M; lcu-a postfurcal. Hind wing 4.8 times as long as wide.

Hind leg: Coxa rugose dorsally. Length of femur, tibia and basitarsus about 4.3, 8.6 and 8.2 times their width, respectively; tibial spurs 0.49 and 0.32 times as long as basitarsus.

Metasoma: Basal three metasomal terga largely smooth; second metasomal tergum with some distinct punctures antero-sublaterally. First tergum 1.5 times as long as wide apically, dorsal carinae absent. Second and third terga comgbined 1.6 times as long as wide at second metasomal suture; second metasomal suture distinct, smooth; lateral crease of third tergum only distinct anteriorly. Ovipositor sheath almost as long as fore wing and 5.6 times as long as metafemur.

Color: Black; palpi blackish brown, basal first metasomal tergum, second metasomal tergum and anterior third metasomal tergum reddish, posterior metasomal tergum dark brown. Antenna blackish brown. Wings faintly brownish hyaline; stigma and veins dark brown. Legs reddish brown; procoxa, mesocoxa, basal metacoxa, trochanters, apical metafemur, metatibia and tarsi dark brown to blackish brown, metatibial spurs reddish brown. Ovipositor sheath blackish brown.

Length: Body 6.2 mm, antenna 5.4 mm, fore wing 4.7 mm, ovipositor sheath 4.6 mm.

Male: Unknown.

Specimen examined: Holotype: ♀, Tayuling, 12-15.IX.1980 (KSL & CHW).

Distribution: Taiwan.

Host: Unknown.

Remarks: This species can be easily descriminated from the other Taiwanese species of the genus *Orgilus* by the ovipositor sheath almost as long as fore wing and the antenna with 40 segments.

Etymology: *Amplissimus* means larger in Latin, refers to its larger body length.

Orgilus caballus sp. n.

(Figs. 9, 22, 36, 51, 64, 78, 94, 109, 122, 136, 151)

Female: Head: 1.6 times as wide as long and 1.0-1.1 times wider than mesonotum. Eye 1.3-1.4 times as long as temple in dorsal view, eye height 1.9 times eye length in lateral view. Temple densely punctulate; gena coriaceous-granulate to rugose ventrally. Frons largely glabrous medially, densely punctulate laterally. POL: OD: OOL=1: 0.86-0.92: 2.1-2.3. Vertex densely punctulate. Face and clypeus combined 1.4-1.5 times as high as wide and 0.90-0.94 times as wide as eye height and 0.53 times as wide as head; face convex, densely punctulate; clypeus strongly convex, sparsely punctulate. Tentorial index 0.46-0.58. Malar space 1.9-2.0 times basal width of mandible and 0.44-0.45 times eye height. Length of maxillary palp 0.7 times height of head. Antenna 27-segmented; first flagellomere 0.95-1.1 times as long as second; length of first, second and penultimate flagellomeres 2.4-2.9, 2.5-2.8 and 1.2-1.3 times their width, respectively.

Mesosoma: 1.5 times as long as high. Pronotal side rather densely punctulate dorsally, rugose-reticulate ventrally. Notauli well impressed, crenulate; mesoscutum densely punctate; scutellum rather densely punctate. Mesopleuron largely rather sparsely punctate above precoxal sulcus, densely punctulate below precoxal sulcus, precoxal sulcus crenulate. Metapleuron rather densely punctulate Propodeum rather densely punctulate to punctate, rugose-reticulate medially and around spiracle.

Wings: Fore wing: Stigma 3.1 times as long as wide; basal posterior section of stigma 1.1 times apical posterior section of stigma; r-rs: 3+4/Rs: 2/Rs=1: 5.2-5.8: 1.4-1.6; r-rs 0.86 times as long as stigma width; length of vein R1 6.1-6.5 times fore wing length from apex of cell 2R1 to wing apex; 2+3/M 1.3 times as long as 2/Rs+M; 1cu-a postfurcal. Hind wing 4.0-4.4 times as long as wide.

Hind leg: Coxa rather rugulose dorsally. Length of femur, tibia and basitarsus about 4.3-4.4, 7.4-8.2 and 8.6-8.8 times their width, respectively, tibial spurs 0.50-0.57 and 0.36-0.38 times as long as basitarsus.

Metasoma: First tergum 0.77-0.83 times as long as wide apically, rugose-reticulate, dorsal carinae distinct in basal half. Second and third terga combined 0.88 times as long as wied at second metasomal suture; second tergum rugose-reticulate; second metasomal suture deep and wide, crenulate; third tergum largely smooth medially, more or less rugose laterally, with complete sharp lateral crease, but more or less weak apically. Ovipositor sheath 0.57-0.63 times as long as fore wing and 2.0-2.3 times as long as metafemur.

Color: Black; mandible and tegula dark brown, palpi yellowish brown. Antenna black. Wings hyaline; stigma and veins dark brown. Legs yellowish brown; apex of mesofemur, fore and middle tibiae and tarsi more or less dark brown; basal metacoxa, apical metafemur and metatarsus blackish brown, basal 0.6 of metatibia more or less lighter. Ovipositor sheath black.

Length: Body 3.8-3.9 mm, antenna 3.4-3.5 mm, fore wing 3.8-4.0 mm, ovipositor sheath 2.2-2.5 mm.

Male: Similar to female. Antenna 26-28-segmented.

Specimens examined: Holotype: ♀, Tsuifeng, 27.VIII.1981 (LYC & SCL). Paratypes: Meifeng, 1♀, 26.VIII.1980 (KSL & CHW); 1♀, 15.VII.1982 (SCL & CNL). Tayuling, 8♀, 1♂, 12-15.IX.1980 (KSL & CHW); 4♀, 6-9.IX.1983 (LYC & KCC). Tsuifeng, 1♀, 27.VIII.1981 (LYC & SCL); 4♂, 1-3.IX.1982 (LYC & KCC); 1♀, 15-16.VIII.1984 (KCC); 3♀, 1♂, 12-14.IX.1984 (KSL & SCL). Wuling, 1♂, 27-29.VI.1979 (KSL & LYC).

Distribution: Taiwan.

Host: Unknown.

Remarks: This species is close to *O. parapappianus* sp. n., but differs from it by the third metasomal tergum largely smooth medially and the gena wider ventrally.

Etymology: *Caballus* means horse in Latin, refers to its longer face.

Orgilus caritus sp. n.

(Figs. 14, 34, 48, 62, 76, 92, 106, 120, 134, 147, 156)

Female: Head: 1.6 times as wide as long and 1.1 times wider than mesonotum, granulate-coriaceous. Eye 2.4-2.5 times as long as temple in dorsal view, eye height 1.5 times eye length in lateral view. POL: OD: OOL=1: 1.0: 2.5. Face and clypeus combined 0.97-1.0 times as high as wide and 1.1-1.2 times as wide as eye height and 0.60 times as wide as head; convex. Tentorial index 0.67. Malar space 1.0 times basal width of mandible and 0.29-0.30 times eye height. Length of maxillary palp 0.9 times height of head. Antenna 29-segmented; first flagellomere 1.2 times as long as second; length of first, second and penultimate flagellomeres 3.2-3.5, 2.7-2.9 and 2.0 times their width, respectively.

Mesosoma: 1.5-1.6 times as long as high. Pronotal side coriaceous dorsally, crenulate medioanteriorly, granulate-coriaceous ventrally. Notauli well impressed, crenulate; mesonotum granulate-coriaceous. Mesopleuron largely coriaceous, except largely smooth anteroventrally above precoxal sulcus; precoxal sulcus weakly crenulate. Metapleuron and propodeum coriaceous.

Wings: Fore wing: Stigma 3.8-3.9 times as long as wide; basal posterior section of stigma 1.3-1.4 times apical posterior section of stigma, r-rs: 3+4/Rs: 2/Rs=1: 6.7-6.8: 1.8-1.9; r-rs 0.90 times as long as stigma width; length of vein R1 9.9-10.2 times fore wing length from apex of cell 2R1 to wing apex; 2+3/M absent; 1cu-a postfurcal. Hind wing 4.9-5.0 times as long as wide.

Hind leg: Coxa granulate-coriaceous. Length of femur, tibia and basitarsus about 3.8, 7.4-7.8 and 8.3-9.0 times their width, respectively; tibial spurs 0.50-0.51 and 0.33-0.34 times as long as basitarsus.

Metasoma: First tergum 1.1-1.2 times as long as wide apically, costulate, interspace punctate, dorsal carinae distinct in basal half. Second and third terga combined 1.0-1.1 times as long as wide at second measomal suture; second and third terga punctate-reticulate; second metasomal suture deep and wide, crenulate; third tergum with complete sharp lateral crease; fourth tergum densely punctulate. Oviposior sheath 0.30-0.33 times as long as fore wing and 1.1-1.3 times as long as metafemur.

Color: Brownish yellow, stemmaticum black, tegula yellow. Antenna yellowish brown to brown. Wings hyaline; stigma largely brownish yellow; margin of stigma, and veins brown. Legs brownish yellow; metafemur brown subbasally and apically, metatibial spurs yellow, tarsi light brown to brown, basal metatarsomere 1 lighter. Ovipositor sheath brown.

Length: Body 3.3-3.9 mm, antenna 3.5 mm, fore wing 3.2-3.5 mm, ovipositor sheath 1.1 mm.

Male: Unknown.

Specimens examined: Holotype: Chihpen, 1♀, 15-17.II.1981 (LYC & TL). Paratypes: Tungpu, 1♀, 28.IV-2.V.1981 (TL & CJL); 1♀, 5-8.X.1981 (TL & WST).

Distrbution: Taiwan.

Host: Unknown.

Remarks: This species is close to *O. meifengensis* sp. n., but differs from it by the first metasomal tergum largely sculptured between dorsal carinae, basal posterior section of stigma 1.3-1.4 times apical posterior section of stigma and the fore wing wein r-rs: 3+4/Rs: 2/Rs about 1: 6.8: 1.9.

Etmology: *Caritus* means lacking in Latin, refers to its fore wing vein 2+3/M absent.

Orgilus cretus sp. n.

(Figs. 15, 31, 46, 60, 74, 90, 104, 118, 132, 145)

Female: Head: 1.5 times as wide as long and 1.2 times wider than mesonotum, granulate-coriaceous. Eye 2.0 times as long as temple in dorsal view, eye height 1.4 times eye length in lateral view. POL: OD: OOL=1: 1.0 : 2.2 Face and clypeus combined 1.1 times as high as wide and 1.2 times as wide as eye hieght and 0.58 times as wide as head; convex. Tentorial index 0.73. Malar space 0.88 times basal width of mandible and 0.26 times eye height. Length of maxillary palp 0.9 times height of head. Antenna 33-segmented; first flagellomere 1.2 times as long as second; length of first, second and penultimate flagellomeres 3.6, 2.9 and 2.1 times their width, respectively.

Mesosoma: 1.7 times as long as high. Pronotal side coriaceous dorsoposteriorly, smooth dorsoanteriorly, crenulate medioanteriorly, granulate-coriaceous ventrally. Notauli well impressed, crenulate; mesoscutum granulate-coriaceous, scutellum coriaceous. Mesopleuron smooth to faintly coriaceous above precoxal sulcus, faintly coriaceous below precoxal sulcus; precoxal sulcus punctate. Metapleuron faintly coriaceous. Propodeum smooth to faintly coriaceous.

Wings: Fore wing: Stigma 3.9 times as long as wide; basal posterior section of stigma 1.6 times apical posterior section of stigma; r-rs: 3+4/Rs: 2/Rs=1: 9.0: 2.4; r-rs 0.70 times as long as stigma width; length of vein R1 9.7 times fore wing length from apex of cell 2R1 to wing apex; 2+3/M absent; lcu-a weakly postfurcal. Hind wing 5.7 times as long as wide.

Hind leg: Coxa rather granulate-coriaceous. Length of femur, tibia and basitarsus about 4.2, 8.8 and 8.7 timnes their width, respectively; tibial spurs 0.48 and 0.35 times as long as basitarsus.

Metasoma: First tergum 1.3 times as long as wide apically, densely punctate, with some

rugae laterally, dorsal carinae distinct in basal half. Second and third terga combined 1.2 times as long as wide at second metasomal suture, second tergum densely punctate; second metasomal suture deep and wide, crenulate; third tergum more or less densely punctate anteriorly, smooth posteriorly, with complete sharp lateral crease. Ovipositor sheath 0.35 times as long as fore wing and 1.4 timnes as long as metafemur.

Color: Yellowish brown; frons and vertex medially, mesonotum, propodum, and metasoma largely dark brown. Antenna dark brown. Wings hyaline; stigma largely yellowish brown; margin of stigma, and veins brown. Legs yellowish brown; metatibia dark brown subbasally and apically, metatibial spurs yellowish brown, tarsi dark brown. Ovipositor sheath dark brown.

Length: Body 3.5 mm, antenna 4.5 mm, fore wing 3.6 mm, ovipositor sheath 1.3 mm.

Male: Unknown.

Specimen examined: Holotpe: Meifeng, 1♀, 28-29.VIII.1981 (LYC & SCL).

Distribution: Taiwan.

Host: Unknown.

Remarks: This species is close to *O. lini* sp. n., but differs from it by the second and third metasomal terga combined 1.2 times as long as wide at second metasomal suture, mesosoma 1.7 times as long as high and the antenna 33-segmented.

Etymology: *Cretus* means separate in Latin, refers to its second metasomal suture deep and wide.

Orgilus cunctus sp. n.

(Figs. 16, 27, 42, 56, 70, 86, 100, 116, 128, 141, 154)

Female: Head: 1.6-1.7 times as wide as long and 1.2-1.3 times wider than mesonotum. Eye 1.8-2.0 times as long as temple in dorsal view, eye height 1.6 times eye length in lateral view. Temple and vertex rather densely punctulate. Frons largely glabrous medially, rather densely punctulate laterally. POL: OD: OOL=1: 0.91: 2.2. Face and clypeus 1.0 times as high as wide and 1.1 times as wide as eye height and 0.55 times as wide as head; face convex, rather densely punctate; clypeus strongly convex, rather sparsely punctulate. Tentorial index 0.57-0.60. Malar space 1.0 times basal width of mandible and 0.28-0.29 times eye height. Length of maxillary palp 1.0 times height of head. Antenna 25-segmented; first flagellomere 0.97-1.1 times as long as second; length of first, second and penultimate flagellomeres 2.6-3.1, 2.7-2.9 and 1.5 times their width, respectively.

Mesosoma: 1.8 times as long as high. Pronotal side largely smooth dorsally, weakly crenulate medially, rather granulate-coriaceous ventrally, Notauli well impressed, crenulate; mesoscutum rather densely punctate; scutellum sparsely punctulate. Mesopleuron rather densely punctulate; precoxal sulcus weakly crenulate. Metapleuron rather densely punctate. Propodeum largely reticulate-rugose, smooth apically.

Wings: Fore wing: Stigma 3.2 timnes as long as wide; basal posterior section of stigma 1.2-1.3 times apical posterior section of stigma; r-rs: 3+4/Rs: 2/Rs=1: 6.2-6.8: 1.5-1.6; r-rs 0.79 times as long as stigma width; length of vein R1 9.4-9.7 times fore wing length from

apex of cell 2R1 to wing apex; 2+3/M faintly indicated, 0.2 times as long as 2/Rs+M; 1cu-a postfurcal. Hind wing 4.4-4.6 times as long as wide.

Hind leg: Coxa rather granulate-coriaceous dorsally. Length of femur, tibia and basitarsus 4.2-4.4, 7.4-7.5 and 7.2-7.6 times their width, respectively; tibial spurs 0.47-0.58 and 0.33-0.34 times as long as basitarsus.

Metasoma: First tergum 1.0 times as long as wide apically, reticulate-rugose, smooth apically; dorsal carina distinct anteriorly. Second and third terga combined 1.2-1.4 times as long as wide at second metasomal suture. Second metasomal tergum reticulate-rugose; second metasomal suture deep and wide, crenulate; third tergum reticulate-rugose, smooth apically, with complete sharp lateral crease. Fourth and fifth terga densely punctate anteriorly. Ovipositor sheath 0.83-0.86 times as long as fore wing and 3.2 times as long as metafemur.

Color: Brownish yellow; frons and vertex brown medially, palpi brown, three lobes of mesoscutum, metanotum, propodeum and margins of metapleuron black; metasoma largely black, partely yellowish brown to dark brown. Antenna dark brown. Wings hyaline; stigma and veins dark brown. Legs brownish yellow; subbasal and apical metafemur dark brown, tarsi more or less dark brown; metatibia spurs yellow. Ovipossitor sheath dark brown.

Length: Body 2.9-3.0 mm, antenna 2.8 mm, fore wing 2.7-2.8 mm, ovipositor sheath 2.3-2.4 mm.

Male: Unknown.

Specimens examined: Holotype: ♀, Tungpu, 18-21.X.1982 (KCC & SCL). Paratype: Tungpu, 1♀, XI.1985 (KSL).

Distribution: Taiwan.

Host: Unknown.

Remarks: This species differs from the other Taiwanese *Orgilus* species by the following combination of characters: face and clypeus combined about 1.0 times as high as wide, third metasomal tergum with complete sharp lateral crease and ovipositor sheath about 0.8 times as long as fore wing length.

Etymology: *Cunctus* means all in Latin, refers to its third metasomal tergum with complete sharp lateral crease.

Orgilus galbinus sp. n.

(Figs. 17, 32, 45, 59, 73, 89, 103, 117, 131, 144, 155)

Female: Head: 1.6-1.7 times as wide as long and 1.3 times wider than mesonotum, coriaeous. Eye 2.3 times as long as temple in dorsal view, eye height 1.4 times eye length in lateral view. POL: OD: OOL=1: 1.3 : 2.8. Face and clypeus combined 0.93 times as high as wide and 1.2-1.3 times as wide as eye height and 0.59-0.60 times as wide as head, convex. Tentorial index 0.89-1.0. Malar space 0.88-1.0 times basal width of mandible and 0.30-0.35 times eye height. Length of maxillary palp 1.1-1.2 times height of head. Antenna 21-24-segmented; first flagellomere 1.2 times as long as second; length of first, second and penultimate flagellomeres 3.9-4.0, 3.2-3.3 and 2.3 times their width, respectively.

Mesosoma: 1.7 times as long as high, coriaceous. Pronotal side crenulate medioanteriorly. Notauli well impressed. Precoxal sulcus shallowly depressed.

Wings: Fore wing: Stigma 3.8 times as long as wide; basal posterior section of stigma 1.3-1.4 times apical posterior section of stigma; r-rs: 3+4/Rs: 2/Rs=1: 10.3-10.7: 2.8-2.9; r-rs 0.56 times as long as stigma width; length of vein R1 4.9-5.2 times fore wing length from apex of cell 2R1 to wing apex; 2+3/M absent; lcu-a usually interstitial, seldom antefurcal. Hind wing 5.4-5.7 times as long as wide.

Hind leg: Coxa coriaceous. Length of femur, tibia and basitarsus 4.1-4.3, 8.7-8.8 and 7.6-8.2 times their width, respectively; tibial spurs 0.51-0.53 and 0.32-0.35 times as long as basitarsus.

Metasoma: First tergum 1.1 times as long as wide apically, densely punctate, dorsal carinae distinct in basal half. Second and third terga combined 1.0-1.1 times as long as wide at second metasomal suture. Second tergum punctate-reticulate; second metasomal suture deep and wide, crenulate; third tergum faintly coriaceous anteriorly; lateral crease of third tergum only distinct anteriorly. Ovipositor sheath 0.40-0.42 times as long as fore wing and 1.5-1.6 times as long as metafemur.

Color: Brownish yellow; stemmaticum black. Antenna yellowish brown to dark brown. Wings hyaline; stigma and veins brownish yellow. Legs brownish yellow, metatibial spurs yellow. Ovipositor sheath yellowish brown to dark brown.

Length: Body 2.5-2.7 mm, antenna 3.0 mm, fore wing 2.6-2.7 mm, ovipositor sheath 1.1 mm.

Male: Similar to female.

Specimens examined: Holotype: ♀, Tungpu, XII.1985 (KSL). Paratypes: Meifeng, 1♀, 24-26.VI.1981 (KSL & WST). Shantimen. 1♀, 1-5.III.1982 (KCC & CCP); 1♀, 16-20.I.1984 (KCC & CCP). Tawu, 1♂, 12-14.II.1981 (LYC & TL). Tungpu, 2♀, 25-29.IX.1980 (LYC & TL); 2♀, 18-23.XI.1981 (TL & WST); 1♀, 19-23.VII.1982 (LYC & TL); 1♂, 18-21.X.1982 (KCC & SCL); 3♀, 22-25.XI.1982 (KCC & SPH); 1♀, 10-14.I.1983 (KCC & SPH); 11♀, X, 5♀, XI, 8♀, XII.1985 (KSL). Wushe, 1♀, 6.XI.1981 (SCL & WST).

Distribution: Taiwan.

Host: Unknown.

Remarks: This species is close to *Orgilus moczari* Papp[13], but differs from it by the sculpture of the first and second metasomal terga.

Etymology: *Galbinus* means yellowish in Latin, refers to its body coloration.

Orgilus improcerus sp. n.

(Figs. 18, 29, 43, 58, 71, 84, 88, 101, 110, 129, 142)

Female: Head: 1.7 times as wide as long and 1.2 times wider than mesonotum. Eye 2.1-2.4 times as long as temple in dorsal view, eye height 1.3-1.4 times eye length in lateral view. Temple and vertex rather densely punctulate. Frons glabrous medially, rather densely punctulate laterally, granulate-coriaceous near toruli. POL: OD: OOL=1: 1.1-1.3: 2.7-2.8. Face and clypeus combined 1.0 times as high as wide and 1.1-1.2 times as wide as eye height

and 0.54-0.56 times as wide as head; face slightly convex, densely punctate; clypeus convex, rather densely punctulate. Tentorial index 0.67-0.70. Malar space 1.0 times basal width of mandible and 0.30 times eye height. Length of maxillary palp 1.2 times height of head. Antenna 22-24-segmented; first flagellomere 1.0-1.1 timnes as long as second; length of first, second and penultimate flagellomeres 2.9-3.0, 2.6-3.0 and 1.4-1.5 times their width. respectively.

Mesosoma: 1.4-1.5 times as long as high. Pronotal side largely glabrous dorsally, crenulate medioanteriorly, coriaceous ventrally. Notauli well impressed, crenulate; mesoscutum densely punctate, scutellum rather densely punctate. Mesopleuron rather sparsely punctulate above precoxal sulcus, rather densely punctulate below precoxal sulcus; precoxal sulcus crenulate. Metapleuron rather densely punctulate. Propodeum largely smooth, rugulose to rugose medially.

Wings: Fore wing: Stigma 3.6 times as long as wide; basal posterior section of stigma 0.91-0.96 times apical posterior section of stigma; r-rs: 3+4/Rs: 2/Rs=1: 5.9-6.1: 1.5-1.6; r-rs almost as long as stigma width; length of vein R1 16.6-16.8 times fore wing length from apex of cell 2R1 to wing apex; 2+3/M faintly indicated, 0.2 times as long as 2/Rs+M; 1cu-a postfurcal. Hind wing 4.3-4.4 times as long as wide.

Hind leg: Coxa smooth. Length of femur, tibia and basitarsus 3.5-3.7, 7.8-8.5 and 6.7-7.2 times their width, respectively; tibial spurs 0.54-0.56 and 0.35-0.36 times as long as basitarsus.

Metasoma: First tergum 0.95 times as long as wide apically, costulate, interspace punctate, dorsal carinae distinct in basal half. Second and third terga combined 0.83-0.92 times as long as wide at second metasomal suture. Second tergum largely costulate, interspace punctate, lateral margin smooth; second metasomal suture deep and wide, crenulate; third tergum anteromedially costulate, interspace punctate, rest smooth; lateral crease of third tergum only distinct anteriorly. Ovipositor sheath 0.59-0.63 times as long as fore wing and 2.2 times as long as metafemur.

Color: Brownish yellow; stemmaticum and metasoma beyond second tergum dark brown, second metasomal tergum brownish yellow to dark brown. Antenna brownish yellow to dark brown. Wings hyaline; stigma and veins light brown. Legs brownish yellow. Ovipositor sheath dark brown.

Length: Body 2.8-3.0 mm, antenna 2.7 mm, fore wing 2.6-2.7 mm, ovipositor sheath 1.5-1.7 mm.

Male: Similar to female.

Specimens examined: Holotype: ♀, Lienhuachih, VIII.1984 (KSL & KCC). Paratypes: Kenting, 1♀, 18-23.III.1981 (KSL & TL); 1♀, 1♂, 24-28.VI.1981 (TL & CCP). Lienhuachih, 1♀, VIII.1984 (KSL & KCC); 1♀, 1♂, XI.1984 (KSL & KCC). Ouluanpi, 1♂, 23-25.III.1982 (TL & SCL); 2♂, 12-13.III.1984 (KCC & CCP). Wufeng, 2♂, 14-16.VII.1982 (KCC & CCP).

Distribution: Taiwan.

Host: Unknown.

Remarks: This species differs from the other Taiwanese *Orgilus* species by the following

combination of characters: antenna with 22-24 segments, vertex punctulate, face and clypeus combined about 1.0 times as high as wide, third metasomal tergum without complete sharp lateral crease and ovipositor sheath about 0.6 times as long as fore wing length.

Etymology: *Improcerus* means short in Latin, refers to its first metasomal tergum shorter.

Orgilus ischnus Marshall

(Figs. 10, 28, 39, 54, 67, 81, 97, 112, 125, 138, 152)

Orgilus ischnus Marshall, 1898. Spec. Hym. Eur. Alg. 5(2):197. - Taeger, 1989. Akad. Landwirtschaftswiss. DDR :104.

Orgilus subtilrugosus Papp, 1971. Acta Zool. Hung. 18:56.

Female: Head: 1.5 times as wide as long and almost as wide as mesonotum. Eye 1.7 times as long as temple in dorsal view, eye height 1.6 times eye length in lateral view. Temple, frons (except medially largely smooth) and vertex granulate-coriaceous. POL: OD: OOL=1: 0.50: 1.0. Face and clypeus combined 1.0 times as high as wide and 1.1 times as wide as eye height and 0.61 times as wide as head; strongly convex; face granulate-coriaceous, clypeus densely punctate. Tentorial index 0.67. Malar space 1.6 times basal width of mandible and 0.42 times eye height. Length of maxillary palp 1.1 times height of head. Antenna 31-segmented; first flagellomere 1.1 times as long as second; length of first, second and penultimate flagellomeres 2.8, 2.6 and 1.2 times their width, respectively.

Mesosoma: 1.8 times as long as high. Pronotal side largely granulate-coriaceus, rugose medially. Notauli well impressed, crenulate; mesoscutum coarsely granulate-coriaceous, scutellum granulate-coriaceous. Mesopleuron granulate-coriaceous, precoxal sulcus crenulate. Metapleuron largely granulate - coriaceous, rugose ventrally. Propodeum rugulose-reticulate to rugose-reticulate, smooth basally.

Wings: Fore wing: Stigma 3.9 times as long as wide; basal posterior section of stigma 1.4 times apical posterior section of stigma; r-rs: 3+4/Rs: 2/Rs=1: 5.1: 1.9; r-rs 0.88 times as long as stigma width; length of vein R1 1.1 times fore wing length from apex of cell 2R1 to wing apex; 2+3/M 1.7 times as long as 2/Rs+M; 1cu-a almost interstitial. Hind wing 5.5 times as long as wide.

Hind leg: Coxa granulate-coriaceous, rugulose dorsally. Length of femur, tibia and basitarsus about 3.8, 8.0 and 8.6 times their width, respectively; tibial spurs 0.50 and 0.32 times as long as basitarsus.

Metasoma: First tergum 1.6 times as long as wide apically, costulate, interspace punctate, smooth apically, dorsal carinae absent. Second and third terga combined 1.3 times as long as wide at second metasomal suture, second tergum largely closely punctate, smooth apically; third tergum closely punctate, smooth basally and apically; second metasomal suture distinct, smooth; lateral crease of third tergum only distinct anteriorly; fourth tergum faintly coriaceous anteriorly. Ovipositor sheath 0.54 times as long as fore wing and 1.8 times as long as metafemur.

Color: Black; palpi and tegula dark brown. Antenna dark brown to blackish brown. Wings faintly brownish hyaline; stigma and veins dark brown. Legs dark brown; metacoxa black, metatibial spurs brown. Ovipositor sheath dark brown.

Length: Body 4.1 mm, antenna 4.0 mm, fore wing 3.4 mm, ovipostior sheath 1.8 mm.

Male: Similar to female.

Specimens examined: Tayuling, 1♀, 12-15.IX.1980 (KSL & CHW). Tsuifeng, 1♂, 1-3. IX.1982 (LYC & KCC).

Distribution: Europe, Mongolia, Taiwan (new record).

Host: Unknown.

Orgilus lini sp. n.

(Figs. 19, 33, 47, 61, 75, 91, 105, 119, 133, 146)

Female: Head: 1.7 times as wide as long and 1.1 times wider than mesonotum, granulate-coriaceous. Eye 2.0 times as long as temple in dorsal view, eye height 1.5 times eye length in lateral view. POL: OD: OOL=1: 1.3: 2.7. Face and clypeus combined 1.1 times as high as wide and 1.0 times as wide as eye height and 0.55 times as wide as head; convex. Tentorial index 0.58. Malar space 0.88 times basal width of mandible and 0.23 times eye height. Length of maxillary palp 1.0 times height of head. Antenna 29-segmented; first flagellomere 1.2 times as long as second; length of first, second and penultimate flagellomeres 3.3, 2.7 and 1.9 times their width, respectively.

Mesosoma: 1.4 times as long as high. Pronotal side coriaceous dorsally, crenulate medioanteriorly, granulate-coriaceous ventrally. Notauli well impressed. crenulate; mesoscutum granulate-coriaceous, scutellum coriaceous. Mesopleuron smooth to slightly coriaceous above precoxal sulcus, slightly coriaceous below precoxal sulcus; precoxal sulcus weakly crenulate. Metapleuron slightly coriaceous. Propodeum smooth.

Wings: Fore wing: Stigma 3.4 times as long as wide; basal posterior section of stigma 1.2 times apical posterior section of stigma; r-rs: 3+4/Rs: 2/Rs=1: 8.1: 2.2; r-rs 0.67 times as long as stigma width; length of vein R1 10.0 times fore wing length from apex of cell 2R1 to wing apex; 2+3/M absent; 1cu-a postfurcal. Hind wing 4.3 times as long as wide.

Hind leg: Coxa rather granulate-coriaceous. Length of femur, tibia and basitarsus about 3.9, 8.3 and 8.3 times their width, respectively; tibial spurs 0.44 and 0.34 times as long as basitarsus.

Metasoma: First tergum 1.1 times as long as wide apically, densely punctate, with some rugae laterally, dorsal carinae distinct in basal half. Second and third terga combined 0.87 times as long as wide at second metasomal suture, second tergum densely punctate; second metasomal suture deep and wide, crenulate; third tergum more or less densely punctate anteriorly, smooth posteriorly, lateral crease only distinct anteriorly. Ovipositor 0.30 times as long as fore wing and 1.1 times as long as metafemur.

Color: Blackish brown; head (except frons and vertex medially), pronotum and tegula yellowish brown. Antenna dark brown. Wings hyaline; stigma and veins dark brown. Legs yellowish brown; metatibia dark brown subbasally and apically, metatibial spurs yellowish

brown, tarsi dark brown. Ovipositor sheath missing.

Length: Body 3.5 mm, antenna 3.9 mm, fore wing 3.5 mm, ovipositor 1.1 mm.

Male: Unknown.

Specimen examined: Holotype: Sungkang 1♀, IX, 1985(KSL).

Distribution: Taiwan.

Host: Unknown.

Remarks: This species is close to *O. cretus* sp. n., but differs from it by the second and third metasomal terga combined 0.87 times as long as wide at second metasomal suture, mesosoma 1.4 times as long as high and the antenna 29-segmented.

Etymology: Name after Mr. Kwei-shui Lin, the collector of this species.

Orgilus meifengensis sp. n.

(Figs. 20, 35, 49, 63, 77, 93, 107, 121, 135, 148)

Female: Head: 1.5 times as wide as long and 1.2 times wider than mesonotum; granulate-coriaceous. Eye 2.2 times as long as temple in dorsal view, eye height 1.4 times eye length in lateral view. Frons deeply depressed medially. POL: OD: OOL=1: 1.0: 2.3. Face and clypeus combined 1.0 times as high as wide and 1.2 times as wide as eye height and 0.61 times as wide as head; face convex, clypeus strongly convex. Tentorial index 0.77. Malar space 1.0 times basal width of mandible and 0.26 times eye height. Length of maxillary palp 1.0 times height of head. Antenna beyond 31 segment broken; first flagellomere 1.2 times as long as second; length of first and second flagellomeres 3.7 and 3.1 times their width, respectively.

Mesosoma: 1.7 times as long as high. Pronotal side coriaceous dorsally, crenulate medioanteriorly, granulate-coriaceous ventrally. Notauli well impressed, crenulate, mesonotum granulate-coriaceous. Mesopleuron largely coriaceous, except largely smooth anteroventrally above precoxal sulcus; precoxal sulcus weakly crenulate. Matapleuron coriaceous. Propodeum largely smooth, rugulose medially.

Wings: Fore wing: Stigma 3.7 times as long as wide, basal posterior section of stigma 1.6 times apical posterior section of stigma; r-rs: 3+4/Rs : 2/Rs =1: 8.6: 2.4; r-rs 0.65 times as long as stigma width; length of vein R1 9.2 times fore wing length from apex of cell 2R1 to wing apex; 2+3/M absent; 1cu-a weakly postfurcal. Hind wing 5.5 times as long as wide.

Hind leg: Coxa granulate-coriaceous. Length of femur, tibia and basitarsus about 4.2, 8.0 and 8.3 times their width, respectively; tibial spurs 0.48 and 0.37 times as long as basitarsus.

Metasoma: First tergum 1.2 times as long as wide apically; largely punctate-reticulate, with some rugae, largely glabrous between dorsal carinae; dorsal carinae distinct in basal half. Second and third terga combined 1.1 times as long as wide at second metasomal suture; second tergum punctate-reticulate; second metasomal suture deep and wide, crenulate; third tergum largely punctate-reticulate, smooth spically, with complete sharp lateral crease; fourth tergum densely punctulate. Ovipositor sheath 0.32 times as long as fore wing and 1.3 times as long as metafemur.

Color: Brownish yellow, stemmaticum black, three lobes of mesoscutum more or less dark brown, metanotum, apex propodeum, anterior first metasomal tergum and basal second metasomal tergum dark brown. Antenna brownish yellow to dark brown. Wings hyaline; stigma and veins dark brown. Legs brownish yellow; subbasal and apical metatibia, and metatarsus (except basal basitarsomere yellow) dark brown to blackish brown, metatibial spurs yellow. Ovipositor sheath dark brown.

Length: Body 4.0 mm, antenna more than 4.5 mm, fore wing 3.8 mm, ovipositor sheath 1.2 mm.

Male: Unknown.

Specimen examined: Holotype: Meifeng, 1♀, 24-26.VI.1981 (KSL & WST).

Distribution: Taiwan.

Host: Unknown.

Remarks: This species is close to *O. caritus* sp. n., but differs from it by the first metasomal tergum largely glabrous between dorsal carinae, basal posterior section of stigma 1.6 times apical posterior section of stigma and the fore wing vein r-rs: 3+4/Rs: 2/Rs about 1: 8.6: 2.4.

Etymology: Named after Meifeng, the type locality.

Orgilus parapappianus sp. n.

(Figs. 11, 25, 37, 53, 65, 79, 95, 108, 123, 137)

Female: Head: 1.5-1.6 times as wide as long and 1.0-1.1 times wider than mesonotum. Eye 1.5 times as long as temple in dorsal view, eye height 1.8-1.9 times eye length in lateral view. Temple densely punctulate. Frons largely glabrous medially, densely punctulate laterally. POL: OD: OOL=1: 1.1-1.2: 2.3-2.5. Vertex densely punctulate. Face and clypeus combined 1.4-1.5 times as high as wide and 0.82-0.89 times as wide as eye height and 0.52 times as wide as head; face convex, densely punctulate; clypeus strongly convex, sparsely punctulate. Tentorial index 0.36-0.38. Malar space 2.3-2.4 times basal width of mandible and 0.44-0.45 times eye height. Length of maxillary palp 0.6 times height of head. Antenna 28-segmented; first flagellomere 1.0-1.1 times as long as second; length of first, second and penultimate flagellomeres 2.7-2.8, 2.6-2.8 and 1.2-1.3 times their width, respectively.

Mesosoma: 1.4-1.5 times as long as high. Pronotal side densely punctulate dorsally, rugose-reticulate ventrally. Notauli well impressed, crenulate; mesonotum densely punctate, Mesopleuron rather sparsely punctate above precoxal sulcus, densely punctulate below precoxal sulcus; precoxal sulcus crenulate. Metapleuron rather densely punctulate. Propodeum rather densely punctulate to punctate, rugose-reticulate medially and around spiracle.

Wings: Fore wing: Stigma 3.3 times as long as wide; basal posterior section of stigma 1.2 times apical posterior section of stigma; r-rs: 3+4/Rs: 2/Rs=1: 5.0-5.4: 1.4-1.5; r-rs almost as long as stigma width; length of vein R1 8.8-9.5 times fore wing length from apex of cell 2R1 to wing apex; 2+3/M 1.2 times as long as 2/Rs+M; lcu-a postfurcal. Hind wing 4.0 times as long as wide.

Hind leg: Coxa densely punctate. Length of femur, tibia and basitarsus about 4.0-4.5, 6.1-6.5 and 7.7-8.3 times their width, respectively; tibial spurs 0.52-0.57 and 0.34-0.37 times as long as basitarsus.

Metasoma: First tergum 0.89 times as long as wide apically, rugose-reticulate, dorsal carinae distinct in basal half. Second and third terga combined 1.1 times as long as wide at second metasomal suture; second tergum rugose-reticulate, second metasomal suture deep and wide, crenulate; third tergum largely rugose-reticulate, smooth basally and apically, with complete sharp lateral crease. Ovipositor sheath 0.50-0.57 times as long as fore wing and 1.6-1.8 times as long as metafemur.

Color: Black; mandible and tegula dark brown, palpi yellowish brown. Antenna black. Wings hyaline; stigma and veins dark brown. Legs yellowish brown; apical metafemur, and metatarsus blackish brown, basal 0.5 of metatibia more or less lighter. Ovipositor sheath black.

Length: Body 3.8 mm, antenna 3.8-3.9 mm, fore wing 3.4-3.6 mm, ovipositor sheath 1.8-1.9 mm.

Male: Similar to female. Third metasomal tergum punctate medially.

Specimens examined: Holotype: ♀, Tungpu, 18-21.X.1982 (KCC & SCL). Paratypes: Tungpu, 1♂, 5-8.X.1981 (TL & WST); 1♀, 18-23.XI.1981 (TL & WST);

Distribution: Taiwan.

Host: Unknown.

Remarks: This species is close to *O. pappianus* Taeger[15], but differs from it by the shape of head in lateral view.

Etymology: The specific name of this new species refers to it is close to *O. pappianus* Taeger.

Orgilus planus sp. n.

(Figs. 12, 24, 40, 50, 68, 82, 113, 126, 139, 150)

Female: Head: 1.6 times as wide as long and 1.2 times wider than mesonotum. Eye 1.2 times as long as temple in dorsal view, eye height 1.7 times eye length in lateral view. Temple densely punctulate. Frons largely smooth medially, densely punctulate laterally. POL: OD: OOL=1: 0.50: 1.2. Vertex densely punctulate. Face and clypeus combined 1.1 times as high as wide and 1.1 times as wide as eye height and 0.59 times as wide as head; strongly convex, densely punctate, with some rugae near toruli. Tentorial index 0.62. Malar space 1.6 times basal width of mandible and 0.47 times eye height. Length of maxillary palp 0.9 times height of head. Antenna 30-segmented; first flagellomere 1.3 times as long as second; length of first, second and penultimate flagellomeres 2.6, 2.1 and 1.0 times their width, respectively.

Mesosoma: 1.4 times as long as high. Pronotal side rather densely punctulate dorsally; rugose medially, rugulose ventrally. Notauli well impressed, crenulate; mesoscutum densely punctate, scutellum rather densely punctulate. Mesopleuron rather densely punctulate above precoxal sulcus, densely punctulate below precoxal sulcus; precoxal sulcus crenulate. Metapleuron rather densely punctulate, rugose ventrally. Propodeum largely rugose-reticu-

late, smooth basally.

Wings: Fore wing: Stigma 3.2 times as long as wide; basal posterior section of stigma 1.4 times apical posterior section of stigma; r-rs: 3+4/Rs: 2/Rs=1: 3.8: 1.4; r-rs almost as long as stigma width; length of vein R1 2.0 times fore wing length from apex of cell 2R1 to wing apex; 2+3/M 1.1 times as long as 2/Rs+M; lcu-a postfurcal. Hind wing 4.0 times as long as wide.

Hind leg: Coxa rugose dorsally. Length of femur, tibia and basitarsus about 4.6, 8.3 and 7.1 times their width, respectively; tibial spurs 0.56 and 0.38 times as long as basitarsus.

Metasoma: First tergum 1.2 times as long as wide apically, largely smooth, with some rugulae and punctures, dorsal carinae absent. Second and third terga combined 1.2 times as long as wide at second metasomal suture, second and third terga smooth; second metasomal suture weak, smooth; lateral crease of third tergum only distinct anteriorly. Ovipositor sheath 0.42 times as long as fore wing and 1.2 times as long as metafemur.

Color: Black; palpi dark brown. Antenna blackish brown. Wings fainthy brownish hyaline; stigma and veins dark brown. Legs dark brown to blackish brown, metatibial spurs brown. Oviposito sheath dark brown.

Length: Body 3.9 mm, antenna 3.5 mm, fore wing 3.2 mm, ovipositor sheath 1.4 mm.

Male: Similar to female.

Specimens examined: Holotype: ♀, Sungkang, X.1984 (KSL & KCC). Paratype: Tayuling, 1♂, 12-15.IX.1980 (KSL & CHW).

Distribution: Taiwan.

Host: Unknown.

Remarks: This species differs from the other Taiwanese *Orgilus* species by the following combination of characters: face and clypeus combined about 1.1 times as high as wide, vein 3+4/Rs of fore wing ending well before tip of wing, vien 2+3/M of fore wing present, second metasomal tergum smooth, lateral crease of third metasomal tergum only distinct anteriorly and ovipositor sheath about 0.4 times as long as fore wing length.

Etymology: *Planus* means smooth in Latin, refers to its second and third metasomal terga smooth.

Orgilus rarus sp. n.

(Figs. 21, 30, 44, 57, 72, 85, 87, 102, 115, 130, 143)

Female: Head: 1.6-1.7 times as wide as long and 1.1 times wider than mesonotum. Eye 2.2-2.3 times as long as temple in dorsal view, eye height 1.6 times eye length in lateral view. Temple and vertex rather densely punctulate. Frons glabrous medially, rather densely punctulate laterodorsally, granulate-coriaceous lateroventrally. POL: OD: OOL=1: 0.86: 1.7-1.9. Face and clypeus combined 1.1 times as high as wide and 1.0 times as wide as eye height and 0.54-0.55 times as wide as head, slightly convex; face densely punctate; clypeus sparsely punctulate. Tentorial index 0.58-0.60. Malar space 1.1 times basal width of mandible and 0.29-0.31 times eye height. Length of maxillary palp 1.1 times height of head. Antenna 31-32-segmented; first flagellomere 1.0 times as long as second; length of first,

second and penultimate flagellomeres 3.2-3.3, 3.2-3.3 and 1.5-1.6 times their width, respectively.

Mesosoma: 2.0 times as long as high. Pronotal side largely glabrous dorsally, crenulate medially, densely punctate to coriaceous ventrally, densely punctate posteriorly. Notauli well impressed, crenulate; mesoscutum densely punctate, scutellum rather densely punctulate. Mesopleuron rather densely punctulate above precoxal sulcus, densely punctulate below precoxal sulcus; precoxal sulcus crenulate. Metapleuron largely densely punctate, rugose along ventral borders. Propodeum rather densely punctate laterally; densely punctate wigh some rugae medially.

Wings: Fore wing: Stigma 3.9 times as long as wide; basal posterior section of stigma 1.2-1.3 times apical posterior section of stigma; r-rs: 3+4/Rs: 2/Rs=1: 6.5-7.4: 1.6-1.8; r-rs 0.91 times as long as stigma width; length of vein R1 15.7-16.3 times fore wing length from apex of cell 2R1 to wing apex; 2+3/M 0.7 times as long as 2/Rs+M; lcu-a postfurcal. Hind wing 4.3 times as long as wide.

Hind leg: Coxa weakly rugulose dorsally. Length of femur, tibia and basitarsus 4.2-4.5, 8.6-9.5 and 9.3-10.0 times their width, respectively; tibial spurs 0.40-0.41 and 0.24-0.26 times as long as basitarsus.

Metasoma: First tergum 1.3-1.5 times as long as wide apically, costate; dorsal carinae distinct in basal half. Second and third terga combined 1.1-1.2 times as long as wide at second metasomal suture; second tergum costate; second metasomal suture deep and wide, weakly crenulate; third tergum more or less costate anteriorly, rest smooth; lateral crease of third tergum only distinct anteriorly. Ovipositor sheath 1.2-1.3 times as long as fore wing and 4.6-4.8 times as long as metafemur.

Color: Black; face, clypeus and gena yellowish brown, palpi and tegula yellow to brownish yellow, second metasomal tergum dark brown laterally, metasomal terga beyond third tergum more or less yellowish brown to dark brown. Antenna dark brown. Wings hyaline; stigma and veins dark brown. Legs brownish yellow to brownish yellow; metacoxa black basally, lighter towards apex; metatibia and tarsi dark brown, metatibia spurs yellow. Ovipostior sheath dark brown.

Length: Body 4.5-5.0 mm., antenna 4.5-5.0 mm, fore wing 4.0-4.5 mm, ovipositor sheath 4.8-5.7mm.

Male: Similar to female.

Specimens examined: Holotype: ♀, Sungkang, IX.1984 (KSL & KCC). Paratypes: Lushan, 2♀, 27-31.V.1980 (KSL & LYC). Meifeng, 5♀,1♂, 5-9.X.1980 (CCC & CCCh); 1♀, 24-26.VI.1981 (KSL & WST); 3♀,VIII, 7♀, IX. 7♀,X. 1984 (KSL & KCC); 13♀, X.1985 (KSL). Sungkang, 2♀, 15-17.VIII.1984 (KCC); 2♀, 13-15.IX.1984 (KSL & SCL); 1♀, IX. 1984 (KSL & KCC); 30♀, X, 9♀, XI.1984 (KSL & KCC); 8♀, IX, 85♀, X, 2♀, XI.1985 (KSL). Tayuling, 2♀, 10-15.IX.1980 (KSL & CHW). Tsuifeng, 1♀, 1-3.VIII.1981 (TL & WST); 1♀, 27.VIII.1981 (LYC & SCL); 1♀, 15-16.VIII.1984 (KCC); 1♀, 12-14.IX.1984 (KSL & SCL); 3 ♀, VIII, 8♀, IX, 17♀, X, 3♀, XI.1984 (KSL & KCC); 9♀, IX, 5♀, X.1985 (KSL). Wushe, 3 ♀, 6-11.V.1981 (KSL & SCL); 1♀, 30.VIII-2.IX.1982 (LYC & KCC); 1♀, 7.V.1984 (KCC &

CCP); 1♀, 4.VIII.1984 (KSL);1♀, 11-15.IX.1984 (KSL).

Distribution: Taiwan.

Host:Unknown.

Remarks: This species differs from the other Taiwanese *Orgilus* species by the following combination of characters: antenna with 31-32 segments, vertex punctulate, face and clypeus combined about 1.1 times as high as wide, third metasomal tergum without complete sharp lateral crease and ovipositor sheath about 4.6-4.8 times as long as fore wing length.

Etymology: *Rarus* mean scarce in Latin, refers to the male of this species is only one speciment in this study.

Orgilus taiwanensis sp. n.

(Figs. 13, 26, 41, 55, 69, 83, 99, 114, 127, 140, 153)

Female: Head: 1.5 times as wide as long and 1.2-1.3 times wider than mesonotum. Eye 1.4-1.5 times as long as temple in dorsal view, eye height 1.6 times eye length in lateral view. Temple coriaceous; frons (except medially rather smooth) and vertex granulate-coriaceous. POL: OD: OOL=1: 0.56-0.63: 1.3. Face and clypeus combined 1.0 times as high as wide and 1.1 times as wide as eye height and 0.60 times as wide as head; face convex, largely densely punctate, granulate-coriaceous dorsally and laterally, clypeus strongly convex, rather densely punctate. Tentorial index 0.46-0.47. Malar space 1.3-1.4 times basal width of mandible and 0.37-0.39 times eye height; granulate-coriaceous. Length of maxillary palp 1.0 times height of head. Antenna 29-segmented; first flagellomere 1.2-1.3 times as long as second; length of first, second and penultimate flagellomeres 2.7-3.0, 2.1-2.6 and 1.3 times their width, respectively.

Mesosoma: 1.5-1.6 times as long as high. Pronotal side largely granulate-coriaceous; medially rugose. Notauli well impressed, crenulate; mesoscutum densely punctate, scutellum rather sparsely punctulate, Mesopleuron rather sparsely punctulate above precoxal sulcus, largely coriaceous below precoxal sulcus; precoxal sulcus crenulate. Metapleuron smooth to coriaceous, rugose ventrally. Propodeum rugulose-reticulate to rugose-reticulate.

Wings: Fore wing: Stigma 3.8 times as long as wide; basal posterior section of stigma 1.1-1.3 times apical posterior section of stigma; r-rs: 3+4/Rs: 2/Rs=1: 4.9-5.2: 1.8-1.9; r-rs 0.88 times as long as stigma width; length of vein R1 1.4 times fore wing length from apex of cell 2R1 to wing apex; 2+3/M 1.6 times as long as 2/Rs+M; lcu-a postfurcal. Hind wing 4.8-4.9 times as long as wide.

Hind leg: Coxa coriaceous, rugulose dorsally. Length of femur, tibia and basitarsus 4.4-4.7, 7.5-7.6 and 8.2-8.4 times their width, respectively; tibial spurs 0.56-0.57 and 0.42-0.43 times as long as basitarsus.

Metasoma: First tergum 1.4-1.5 times as long as wide apically; weakly punctate medially, rather costulate laterally; smooth basally and apically; dorsal carinae absent. Second and third terga combined 1.3 times as long as wide at second metasomal suture, second tergum densely punctate anteriorly, smooth posteriorly; second metasomal suture

weak, smooth; third tergum smooth, lateral crease only distinct anteriorly. Ovipositor sheath 0.72-0.73 times as long as fore wing and 2.1-2.2 times as long as metafemur.

Color: Black; palpi and tegula dark brown. Antenna dark brown, scape and pedical black. Wings faintly brownish hyaline; stigma and veins dark brown. Legs largely dark brown to blackish brown; procoxa and mesocoxa yellowish brown, metatibial spurs brownish yellow to brown. Ovipositor sheath dark brown.

Length: Body 2.9-3.5 mm, antenna 3.0 mm, fore wing 2.7-3.0 mm, ovipositor sheath 2.0-2.1 mm.

Male: Similar to female. Antenna 30-segmented.

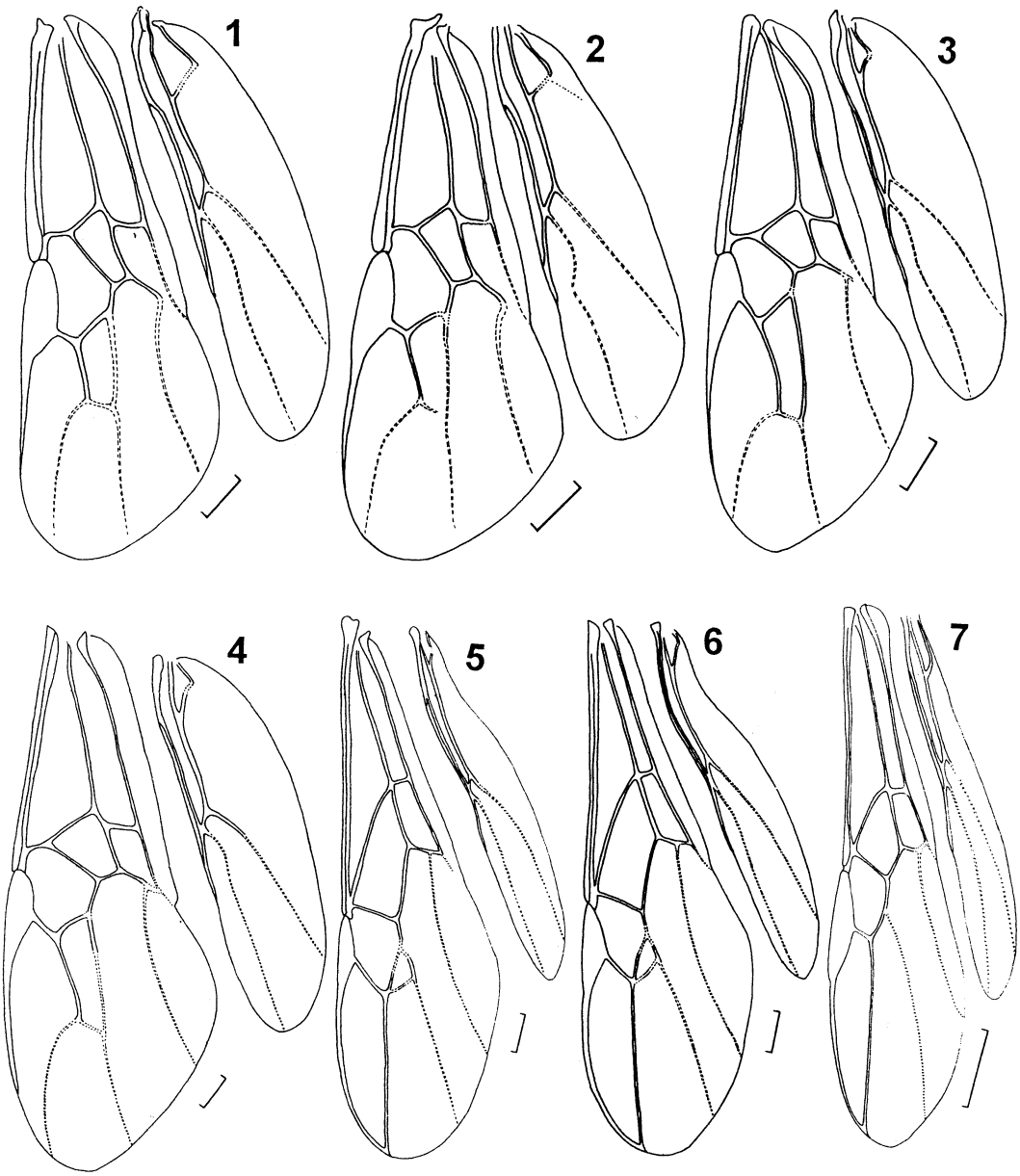
Specimens examined: Holotype: ♀, Tungpu, 25-29.IX.1980 (LYC & TL). Paratypes: Tungpu, 1♂, 25-29.IX.1980 (LYC & TL). Wuling, 1♀, 27-29.VI.1979 (KSL & LYC).

Distribution: Taiwan.

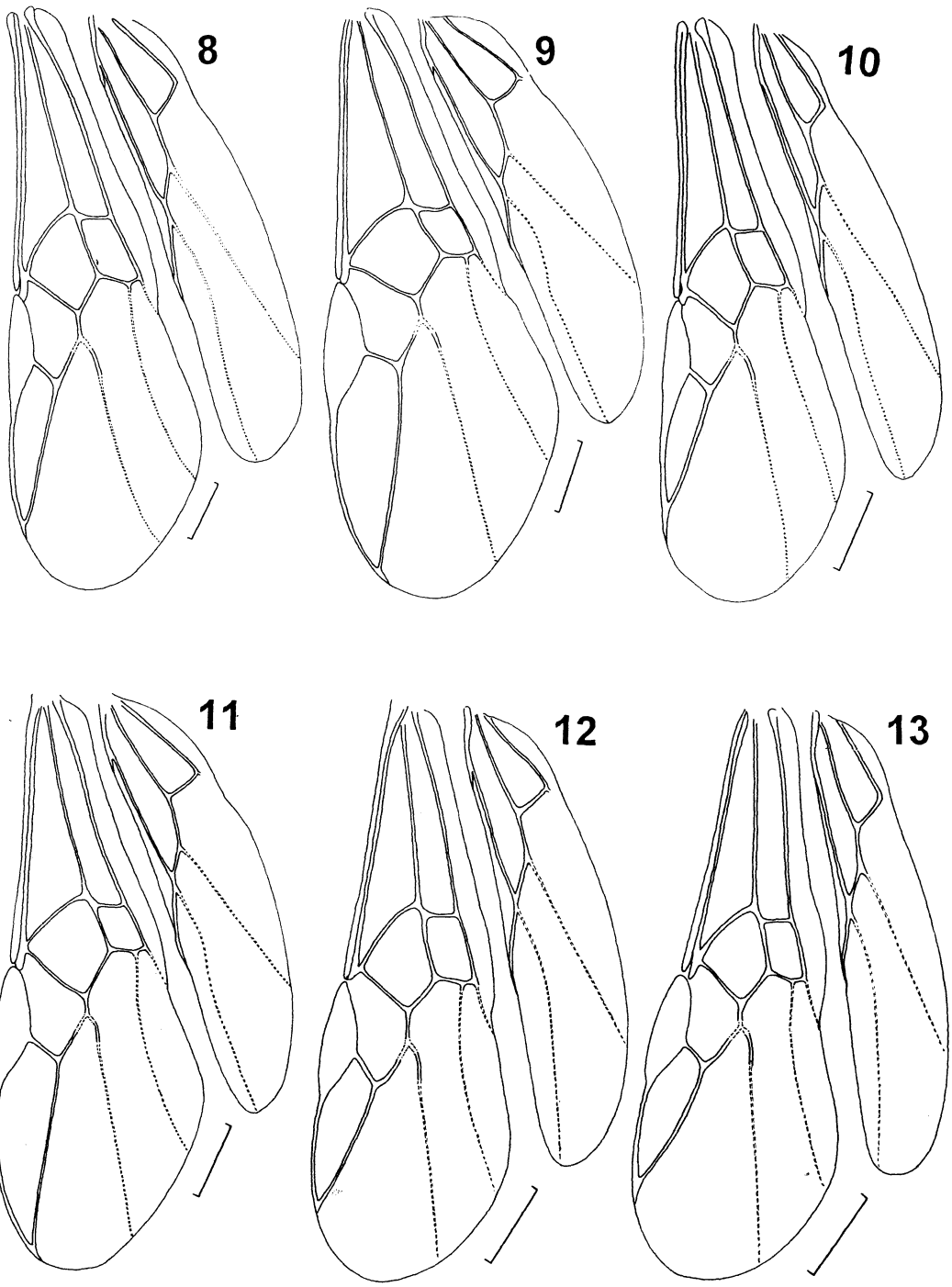
Host: Unknown.

Remarks: This species differs from the other Taiwanese *Orgilus* species by the following combination of characters: face and clypeus combined about 1.0 times as high as wide, vein 3+4/Rs of fore wing ending well before tip of wing, vein 2+3/M of fore wing present, subequal to 2/Rs+M, second metasomal tergum densely punctate anteriorly, lateral crease of third metasomal tergum only distinct anteriorly and ovipositor sheath about 0.7 times as long as fore wing length.

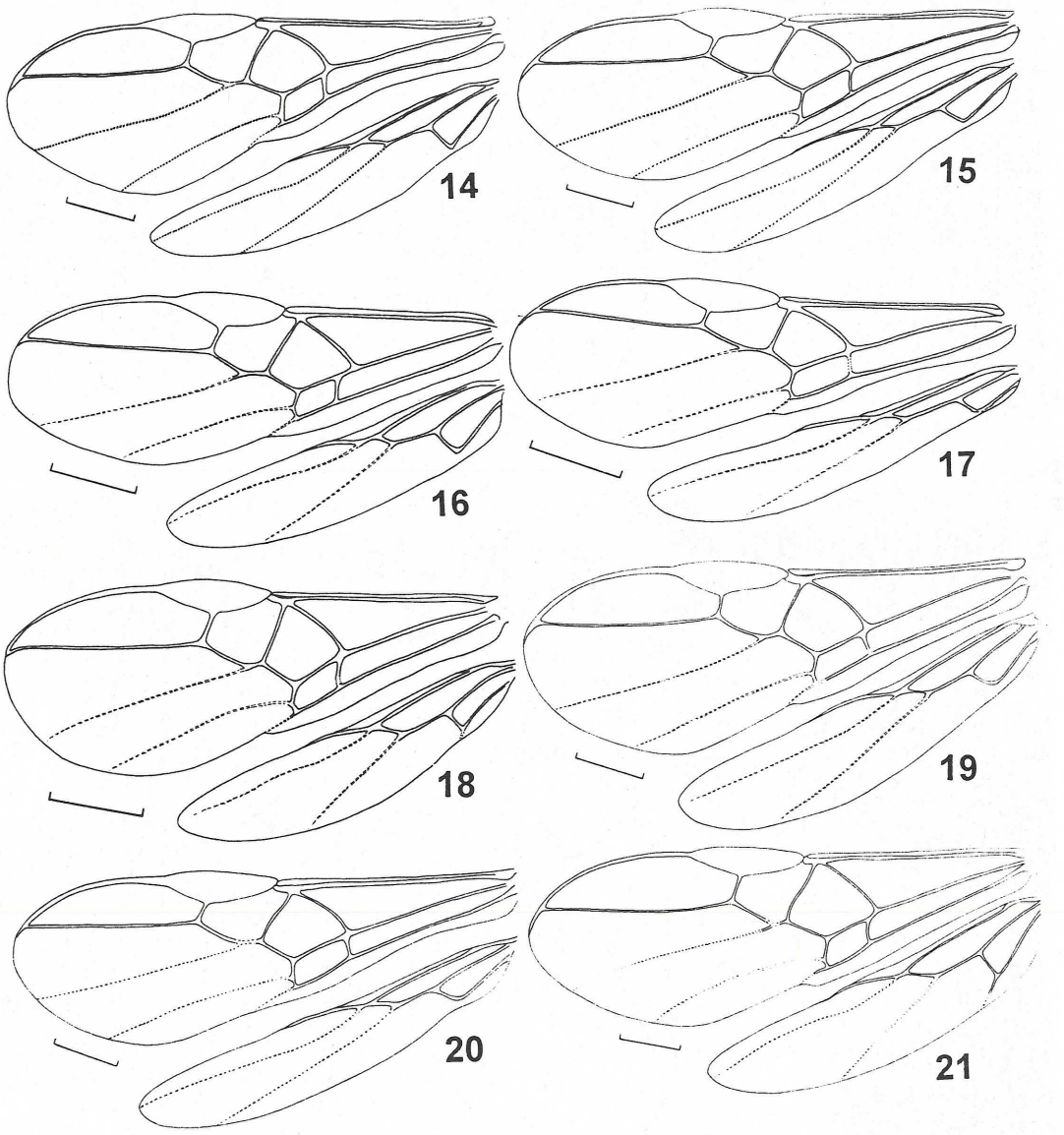
Etymology: Named after Taiwan.



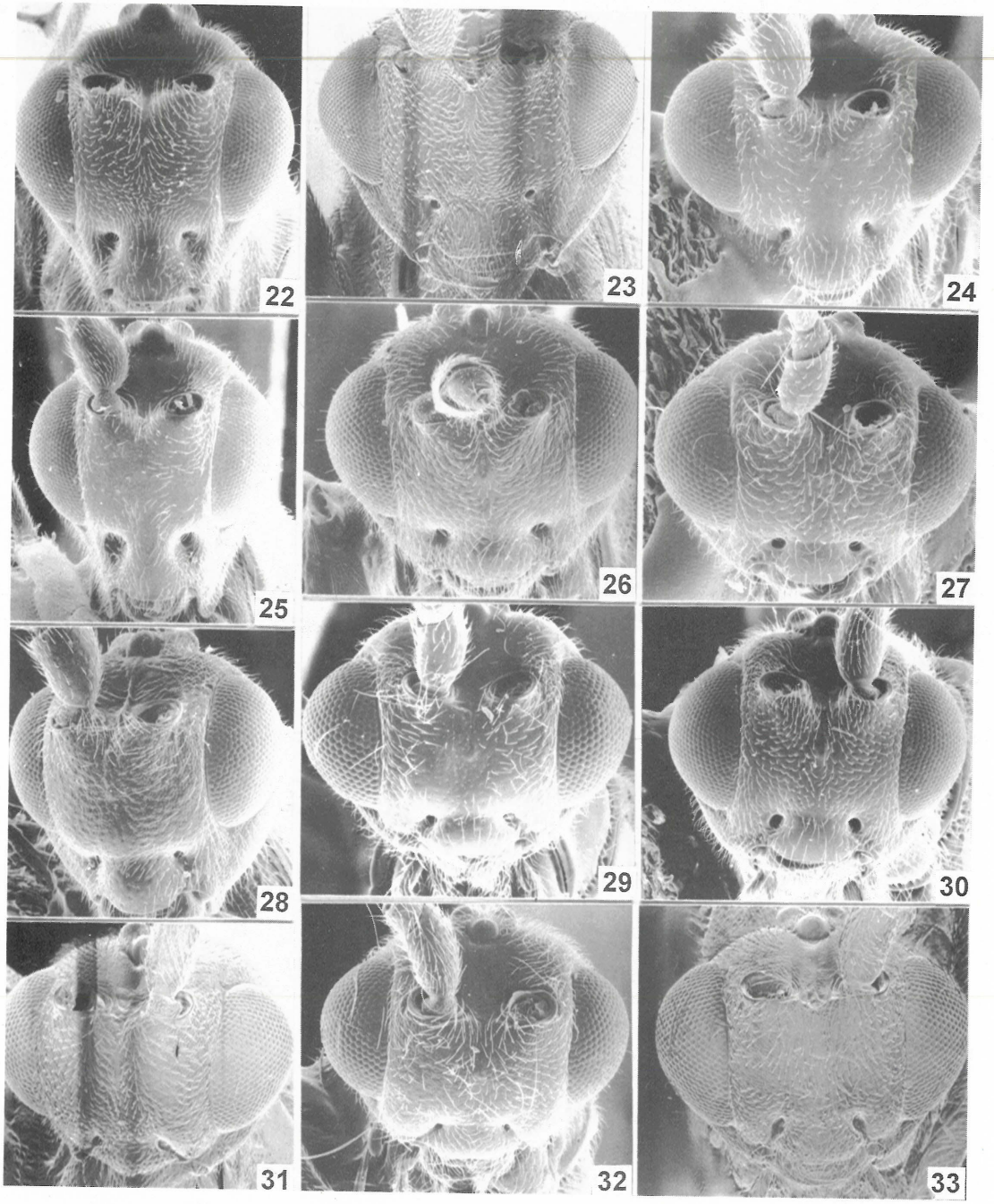
Figs. 1–7. Wings ♀ : 1, *Cardiochiles laevifossa* Enderlein; 2, *C. szepligeti* Enderlein; 3, *Hartemita latipes* Cameron; 4, *H. townesi* Dangerfield & Austin; 5, *Stantonia issikii* Watanabe; 6, *S. ruficornis* Enderlein; 7, *Orgilonia chuchiensis* sp. n. (Scale: 0.5 mm).



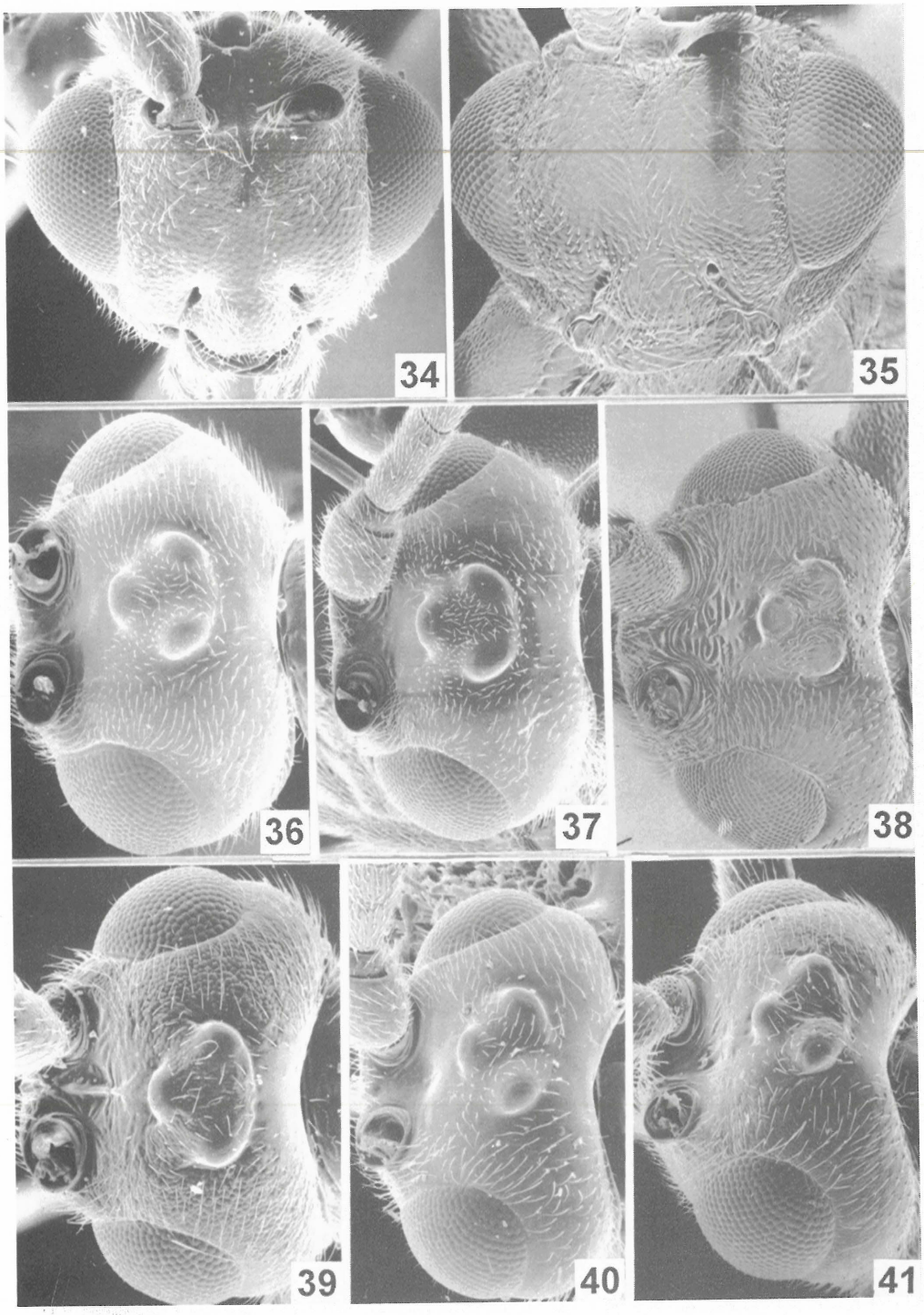
Figs. 8-13. Wings of *Orgilus* spp. ♀ : 8, *amplissimus* sp. n.; 9, *caballus* sp. n.; 10, *ischnus* Marshall; 11, *parapappianus* sp. n.; 12, *planus* sp. n.; 13, *taiwanensis* sp. n. (Scale: 0.5 mm).



Figs. 14–21. Wings of *Orgilus* spp. ♀ : 14, *caritus* sp. n.; 15, *cretus* sp. n.; 16, *cunctus* sp. n.; 17, *galbinus* sp. n.; 18, *improcerus* sp. n.; 19, *lini* sp. n.; 20, *meifengensis* sp. n.; 21, *rarus* sp. n. (Scale: 0.5 mm).

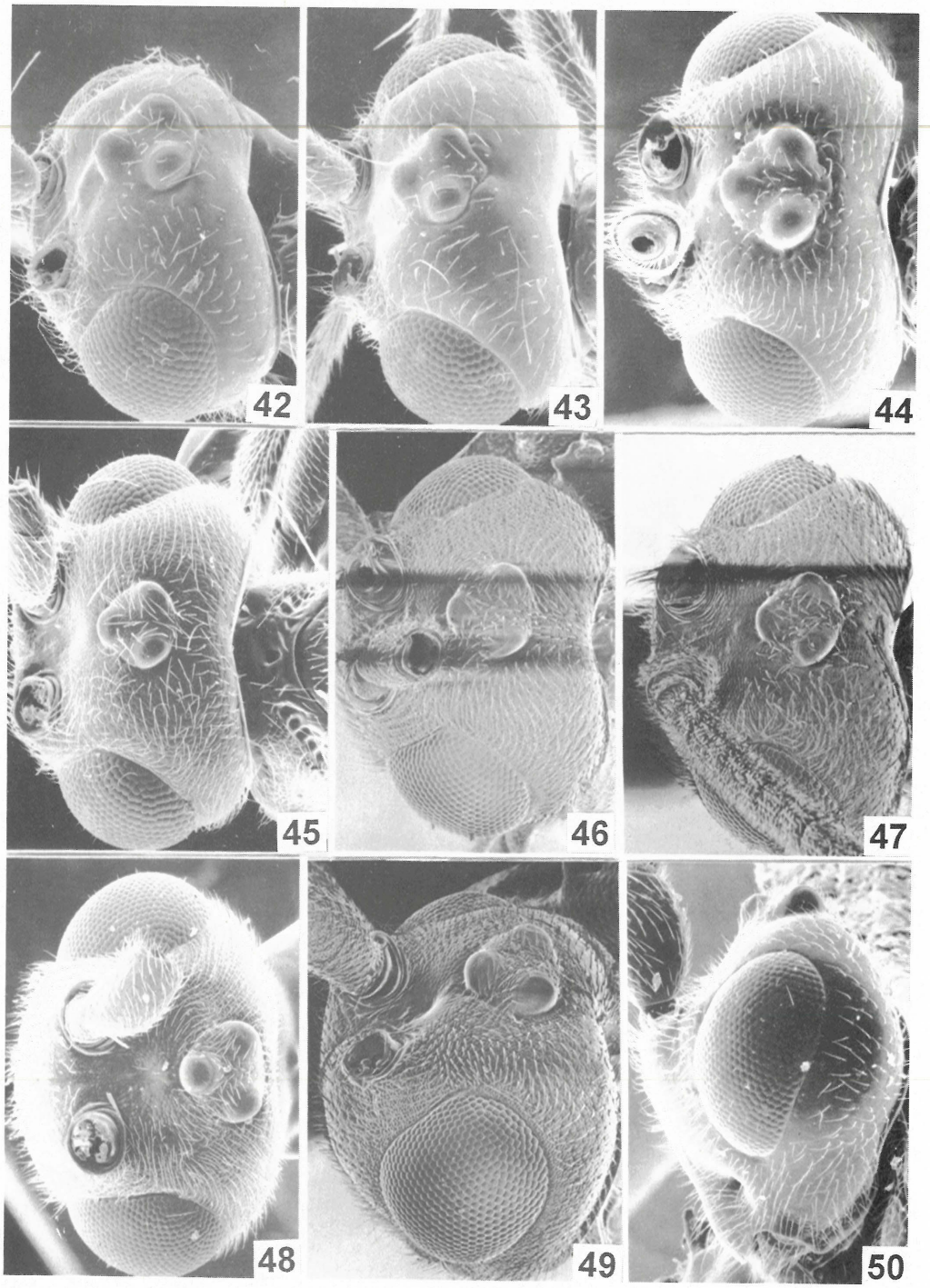


Figs. 22–33. Frontal view of heads of *Orgilus* spp. ♀ (except 24, 28♂): 22, *caballus* sp. n.; 23, *amplissimus* sp. n.; 24, *planus* sp. n.; 25, *parapappianus* sp. n.; 26, *taiwanensis* sp. n.; 27, *cunctus* sp. n.; 28, *ischnus* Marshall; 29, *improcerus* sp. n.; 30, *rarus* sp. n.; 31, *cretus* sp. n.; 32, *galbinus* sp. n.; 33, *lini* sp. n.



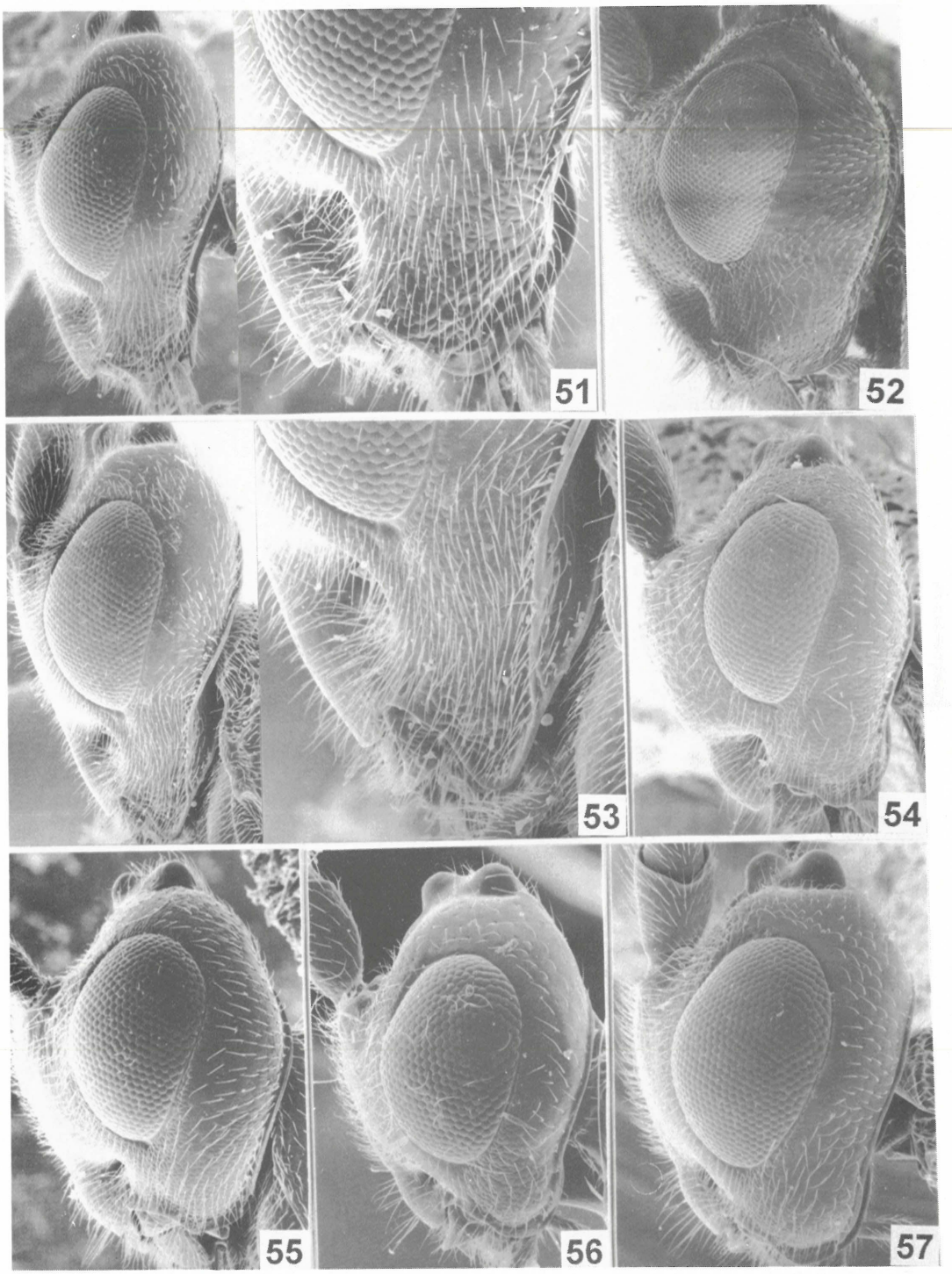
Figs. 34-35. Frontal view of heads of *Orgilus* spp. ♀ : 34, *caritus* sp. n.; 35, *meifengensis* sp. n.

Figs. 36-41. Dorsal view of heads of *Orgilus* spp. ♀ (except 39, 40 ♂): 36, *caballus* sp. n.; 37, *parapappianus* sp. n.; 38, *amplissimus* sp. n.; 39, *ischnus* Marshall; 40, *planus* sp. n.; 41, *taiwanensis* sp. n.

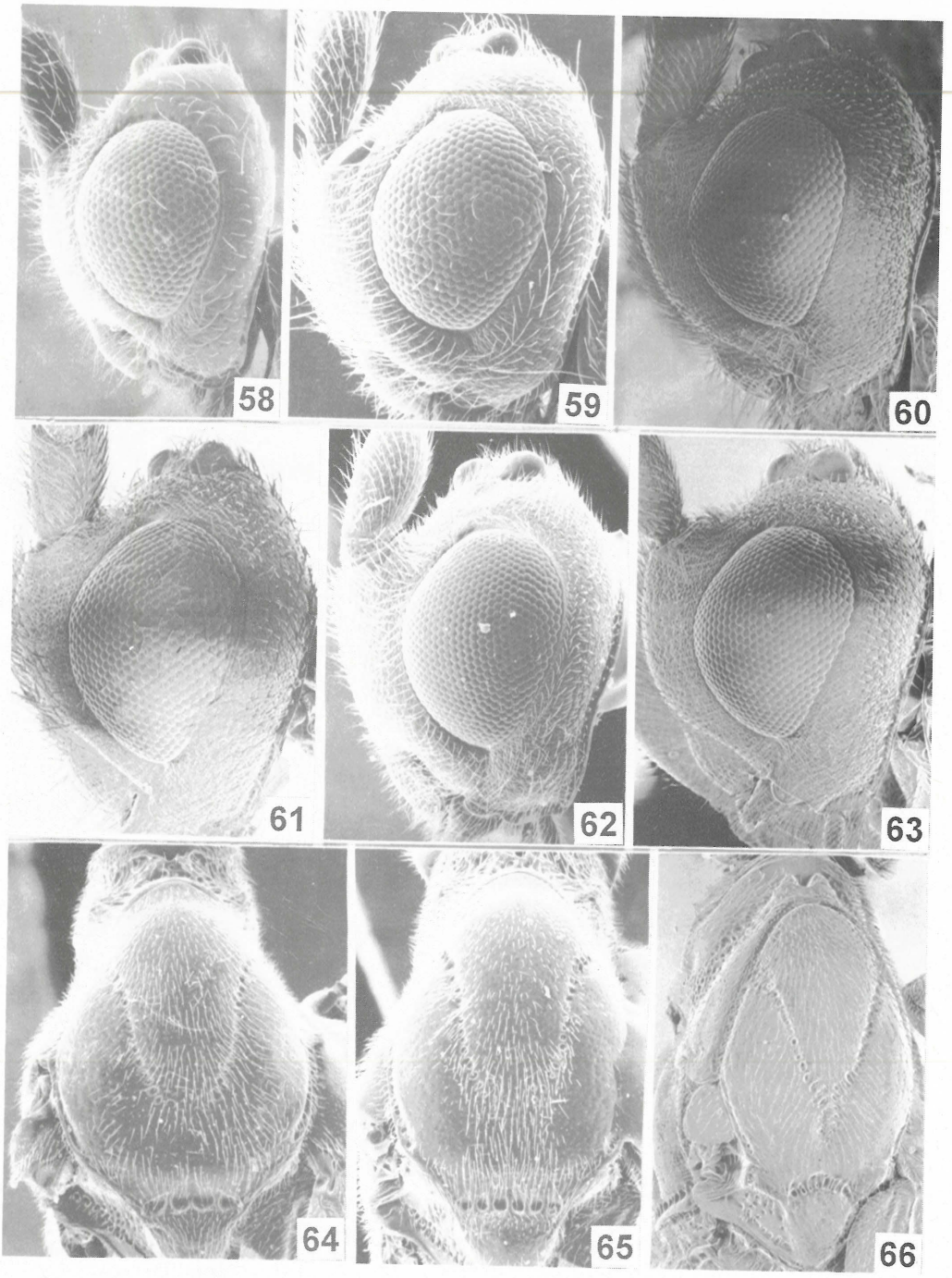


Figs. 42–49. Dorsal view of heads of *Orgilus* spp. ♀ : 42, *cunctus* sp. n.; 43, *improcerus* sp. n.; 44, *rarus* sp. n.; 45, *galbinus* sp. n.; 46, *cretus* sp. n.; 47, *lini* sp. n.; 48, *caritus* sp. n.; 49, *meifengensis* sp. n.

Figs. 50. Lateral view of head of *Orgilus planus* sp. n. ♂.

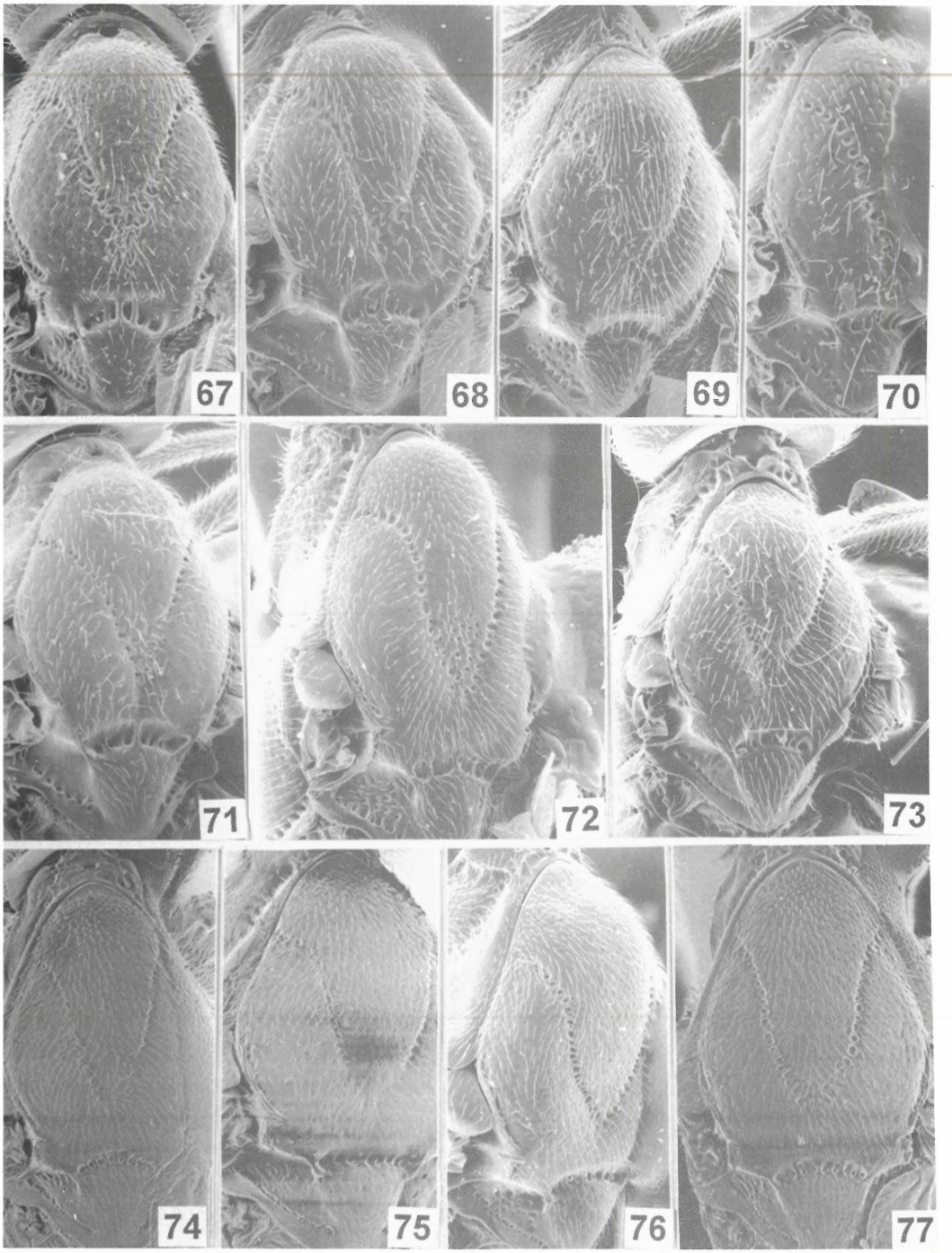


Figs. 51–57. Lateral view of heads of *Orgilus* spp. ♀ (except 54♂): 51, *caballus* sp. n.; 52, *amplissimus* sp. n.; 53, *parapappianus* sp. n.; 54, *ischnus* Marshall; 55, *taiwanensis* sp. n.; 56, *cunctus* sp. n.; 57, *rarus* sp. n.

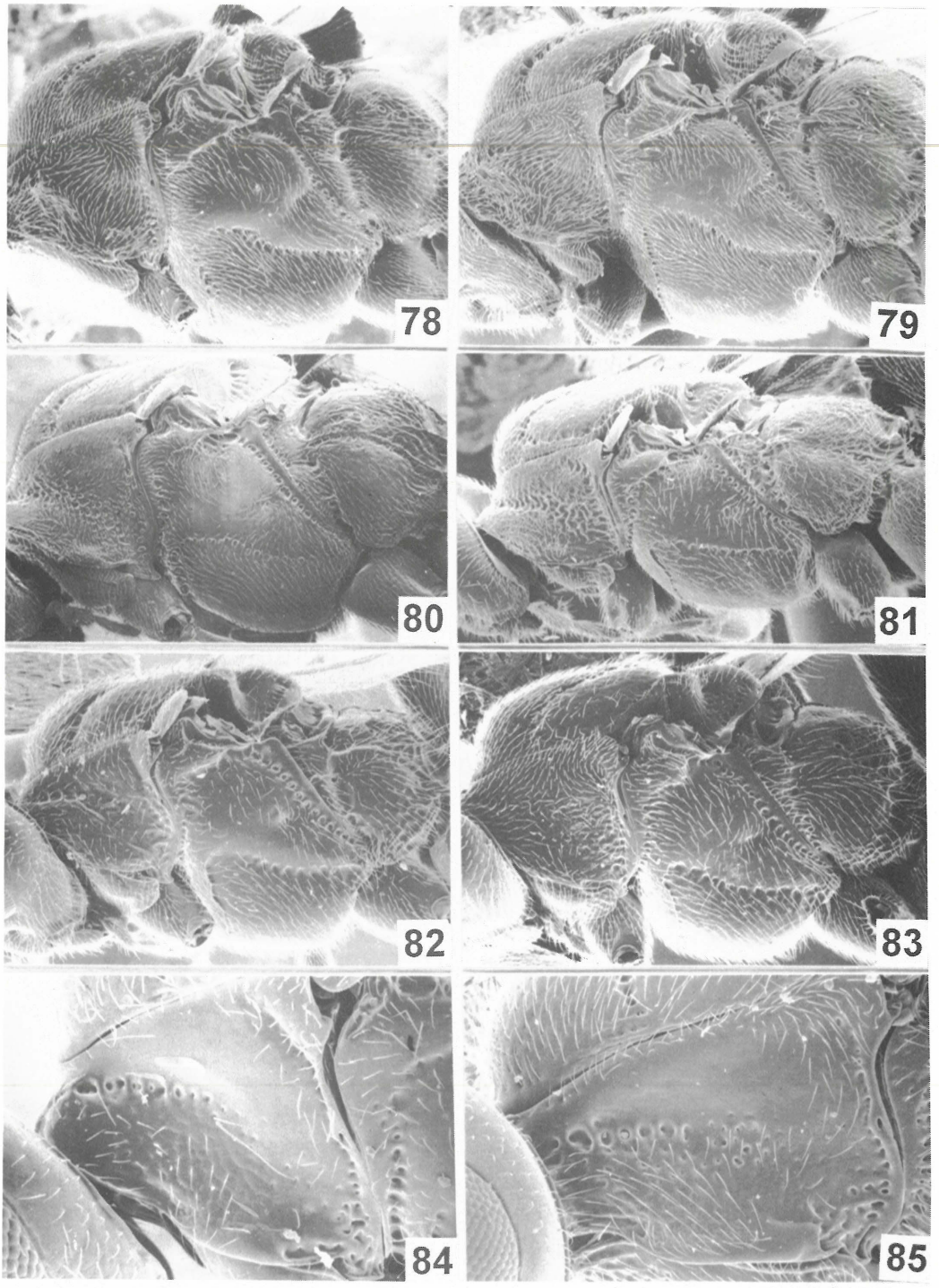


Figs. 58–63. Lateral view of heads of *Orgilus* spp. ♀ : 58, *improcerus* sp. n.; 59, *galbinus* sp. n.; 60, *cretus* sp. n.; 61, *lini* sp. n.; 62, *caritus* sp. n.; 63. *meifengensis* sp. n.

Figs. 64–66. Dorsal view of mesonota of *Orgilus* spp. ♀ : 64, *caballus* sp. n.; 65, *parapappianus* sp. n.; 66, *amplissimus* sp. n.

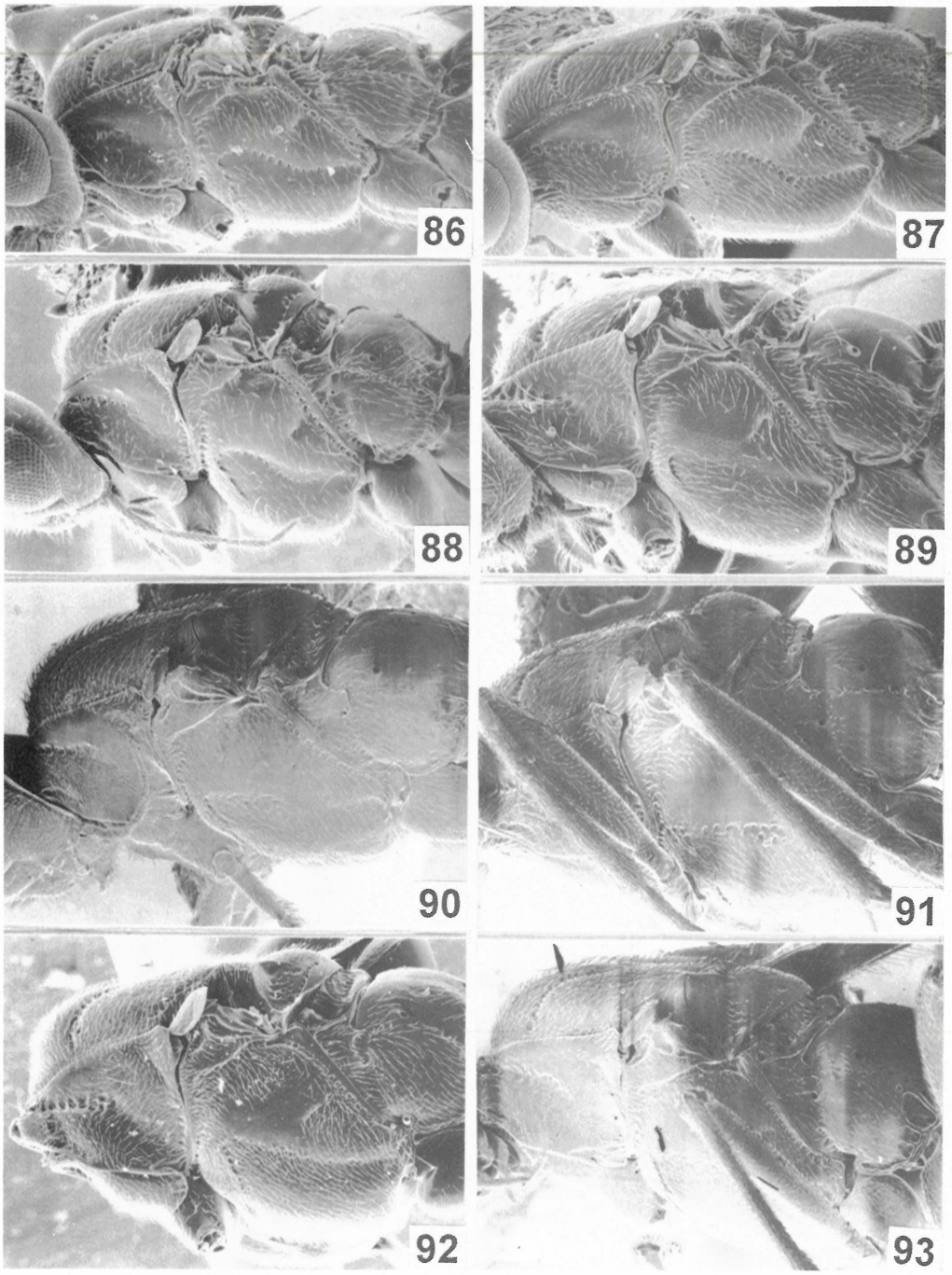


Figs. 67–77. Dorsal view of mesonota of *Orgilus* spp. ♀ (except 67, 68♂): 67, *ischnus* Marshall; 68, *planus* sp. n.; 69, *taiwanensis* sp. n.; 70, *cunctus* sp. n.; 71, *improcerus* sp. n.; 72, *rarus* sp. n.; 73, *galbinus* sp. n.; 74, *cretus* sp. n.; 75, *lini* sp. n.; 76, *caritus* sp. n.; 77, *meifengensis* sp. n.

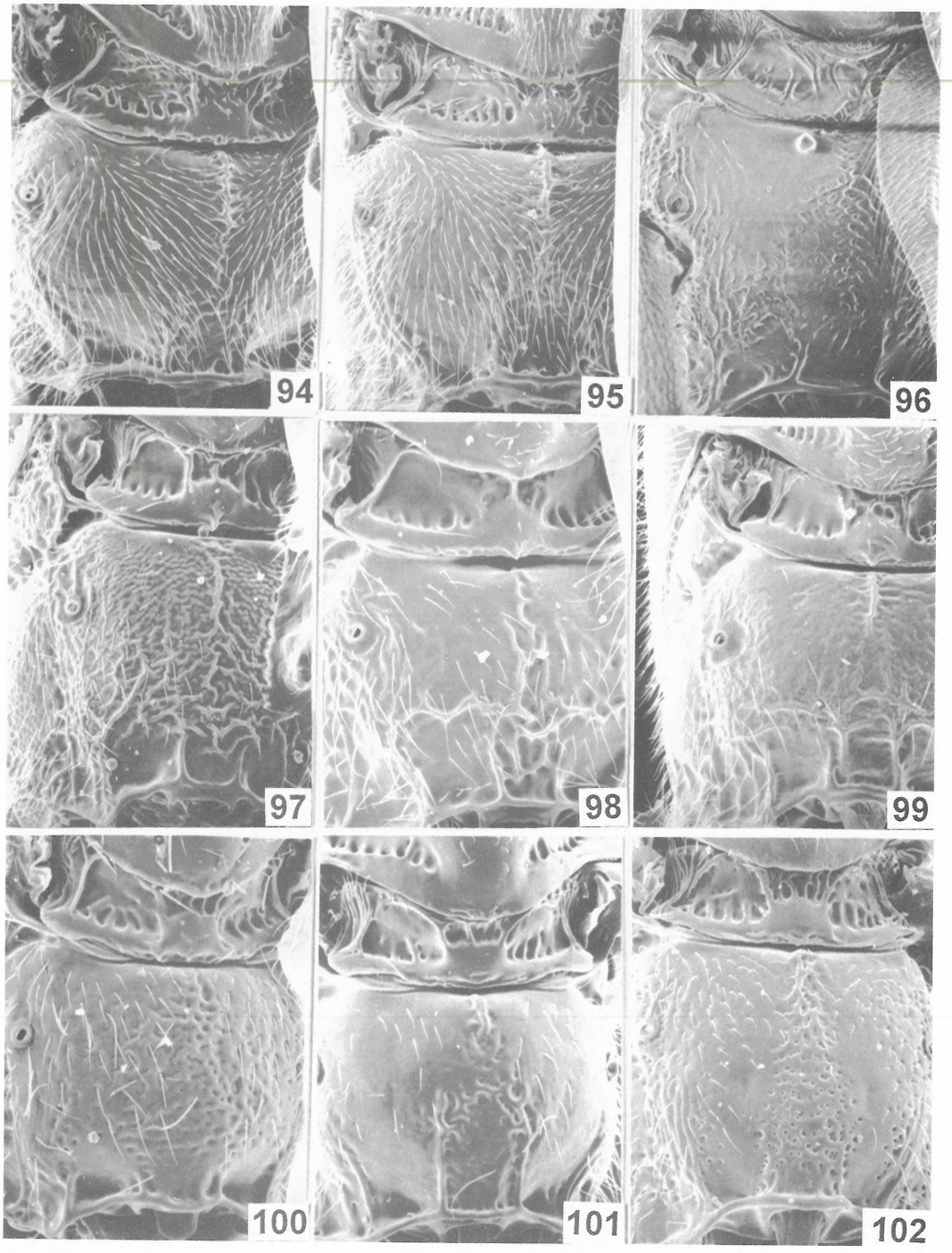


Figs. 78–83. Lateral view of mesosomata of *Orgilus* spp. ♀ (except 81, 82♂): 78, *caballus* sp. n.; 79, *parapappianus* sp. n.; 80, *amplissimus* sp. n.; 81, *ischnus* Marshall; 82, *planus* sp. n.; 83, *taiwanensis* sp. n.

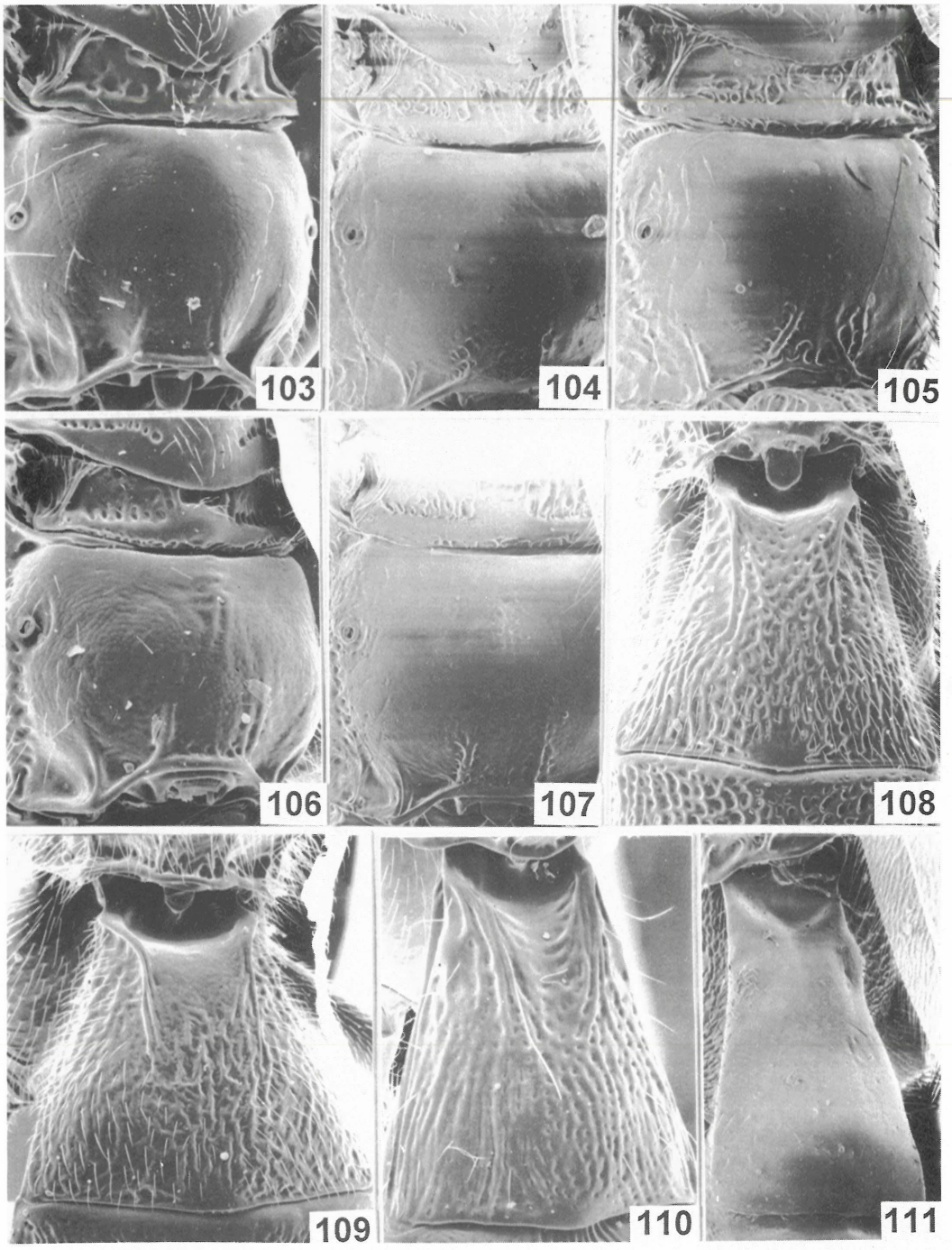
Figs. 84–85. Lateral view of pronota of *Orgilus* spp. ♀ : 84, *improcerus* sp. n.; 85, *rarus* sp. n.



Figs. 86–93. Lateral view of mesosomata of *Orgilus* spp. ♀ : 86, *cunctus* sp. n.; 87, *rarus* sp. n.; 88, *improcerus* sp. n.; 89, *galbinus* sp. n.; 90, *cretus* sp. n.; 91, *lini* sp. n.; 92, *caritus* sp. n.; 93, *meifengensis* sp. n.

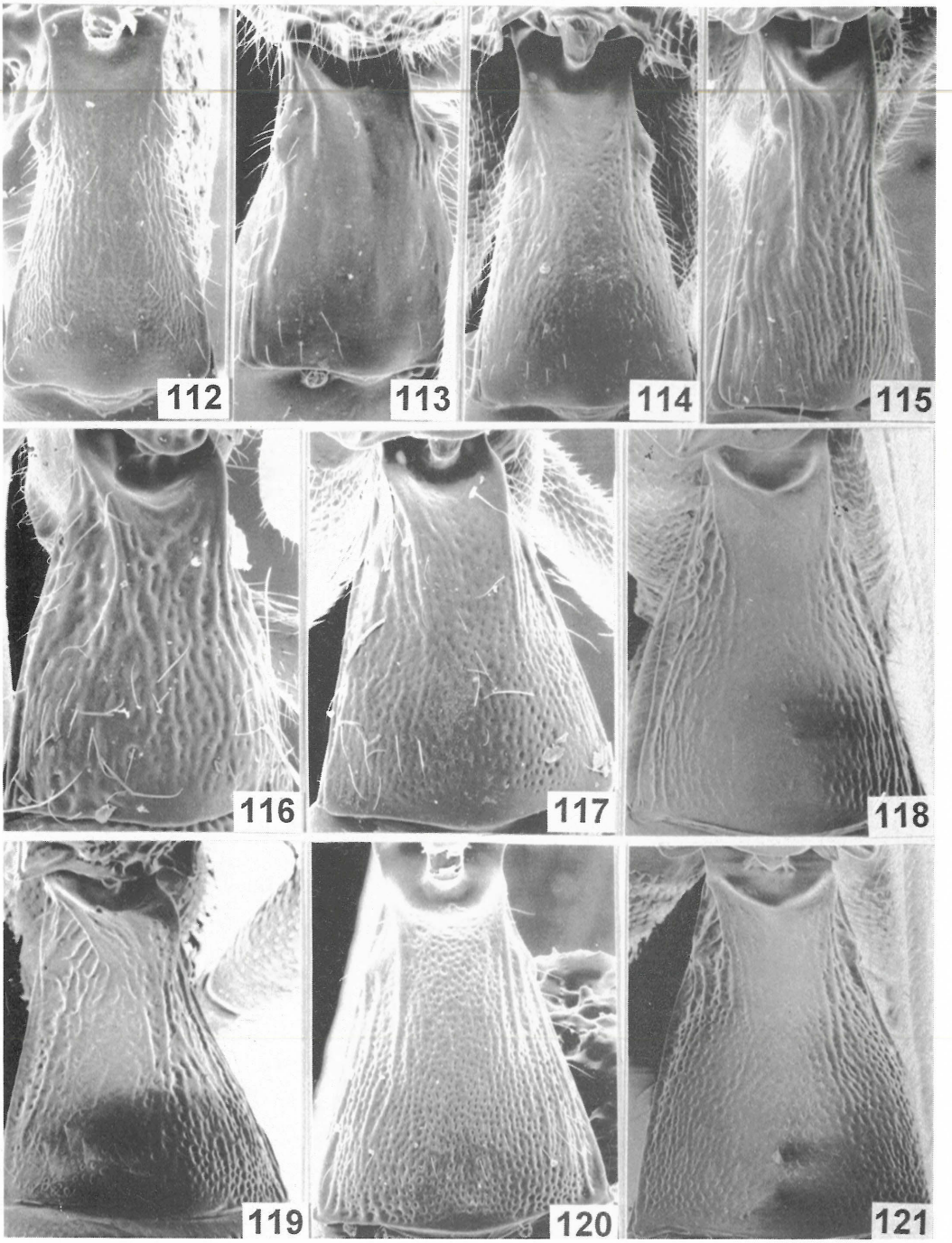


Figs. 94–102. Dorsal view of metanota and propodea of *Orgilus* spp. ♀ (except 97, 98 ♂): 94, *caballus* sp. n.; 95, *parapappianus* sp. n.; 96, *amplissimus* sp. n.; 97, *ischnus* Marshall; 98, *planus* sp. n.; 99, *taiwanensis* sp. n.; 100, *cunctus* sp. n.; 101, *improcerus* sp. n.; 102, *rarus* sp. n.

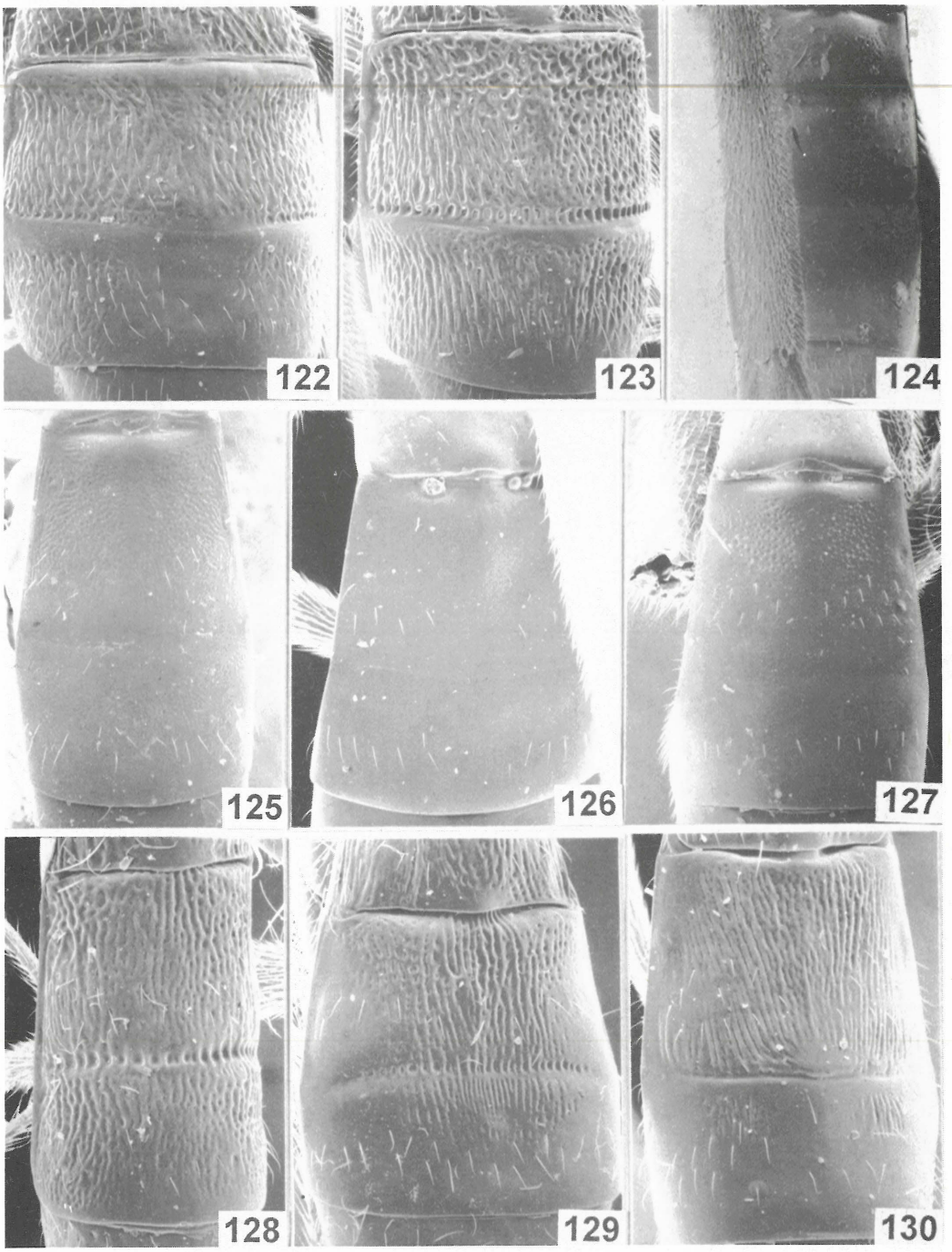


Figs. 103–107. Dorsal view of metanota and propodea of *Orgilus* spp. ♀ : 103, *galbinus* sp. n.; 104, *cretus* sp. n.; 105, *lini* sp. n.; 106, *caritus* sp. n.; 107, *meifengensis* sp. n.

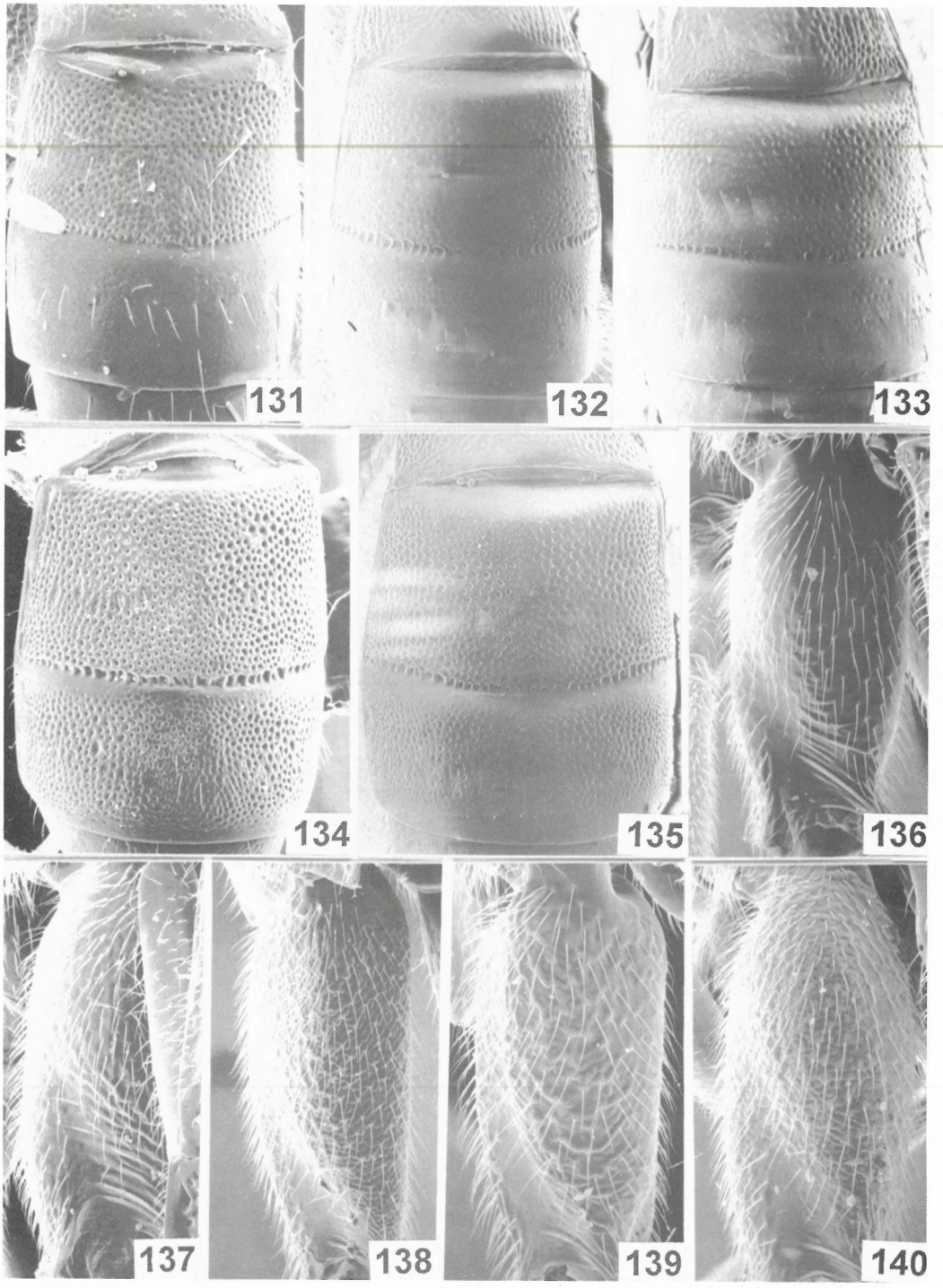
Figs. 108–111. Dorsal view of first metasomal terga of *Orgilus* spp. ♀ : 108, *parapappianus* sp. n.; 109, *caballus* sp. n.; 110, *improcerus* sp. n.; 111, *amplissimus* sp. n.



Figs. 112–121. Dorsal view of first metasomal terga of *Orgilus* spp. ♀ (except 112, 113 ♂): 112, ***ischnus*** Marshall, 113, ***planus*** sp. n.; 114, ***taiwanensis*** sp. n.; 115, ***rarus*** sp. n.; 116, ***cunctus*** sp. n.; 117, ***galbinus*** sp. n.; 118, ***cretus*** sp. n.; 119, ***lini*** sp. n.; 120, ***caritus*** sp. n.; 121, ***meifengensis*** sp. n.

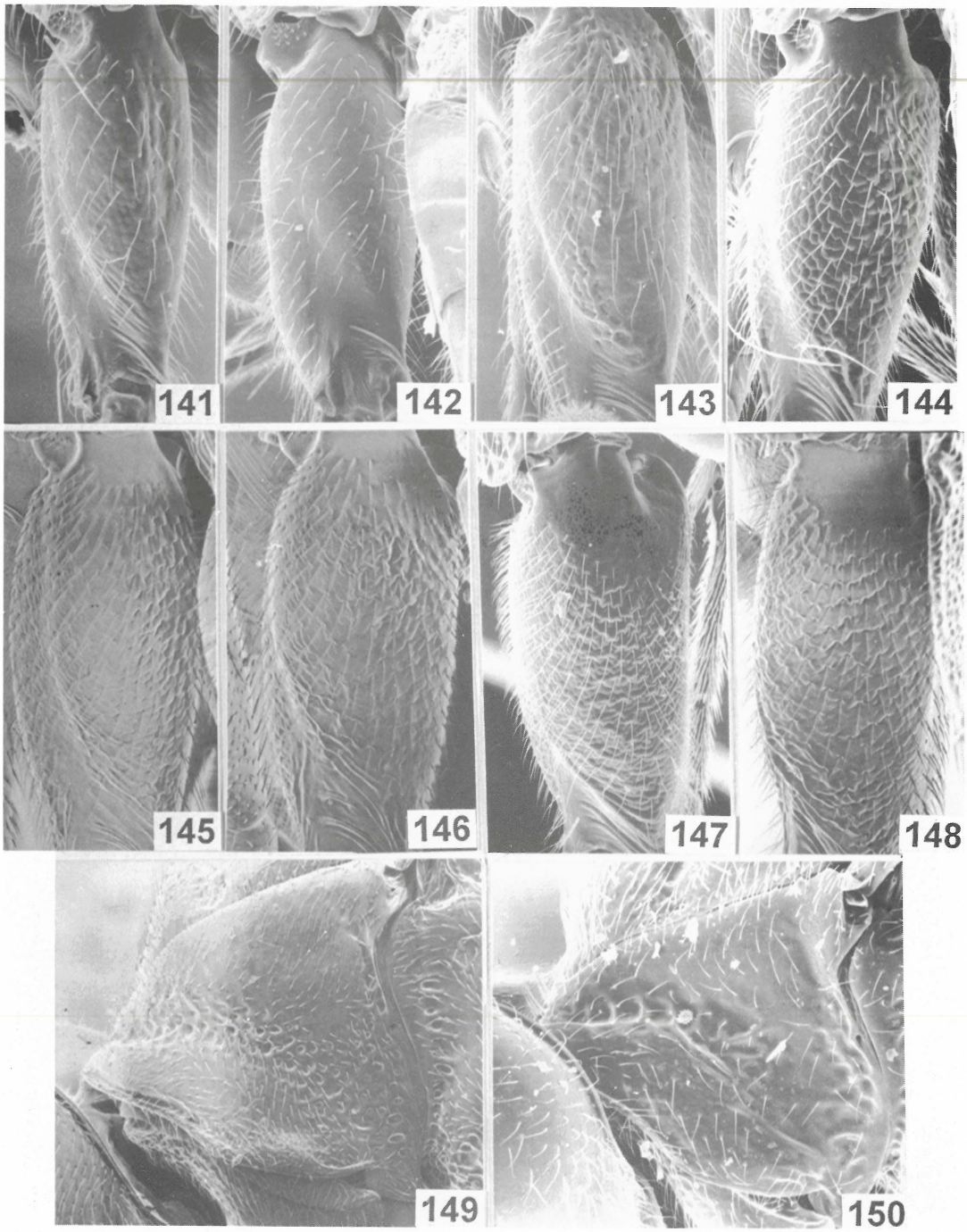


Figs. 122–130. Dorsal view of second and third metasomal terga of *Orgilus* spp. ♀ (except 125, 126♂) : 122, *caballus* sp. n.; 123, *parapappianus* sp. n.; 124, *amplissimus* sp. n.; 125, *ischnus* Marshall; 126, *planus* sp. n.; 127, *taiwanensis* sp. n.; 128, *cunctus* sp. n.; 129, *improcerus* sp. n.; 130, *rarus* sp. n.



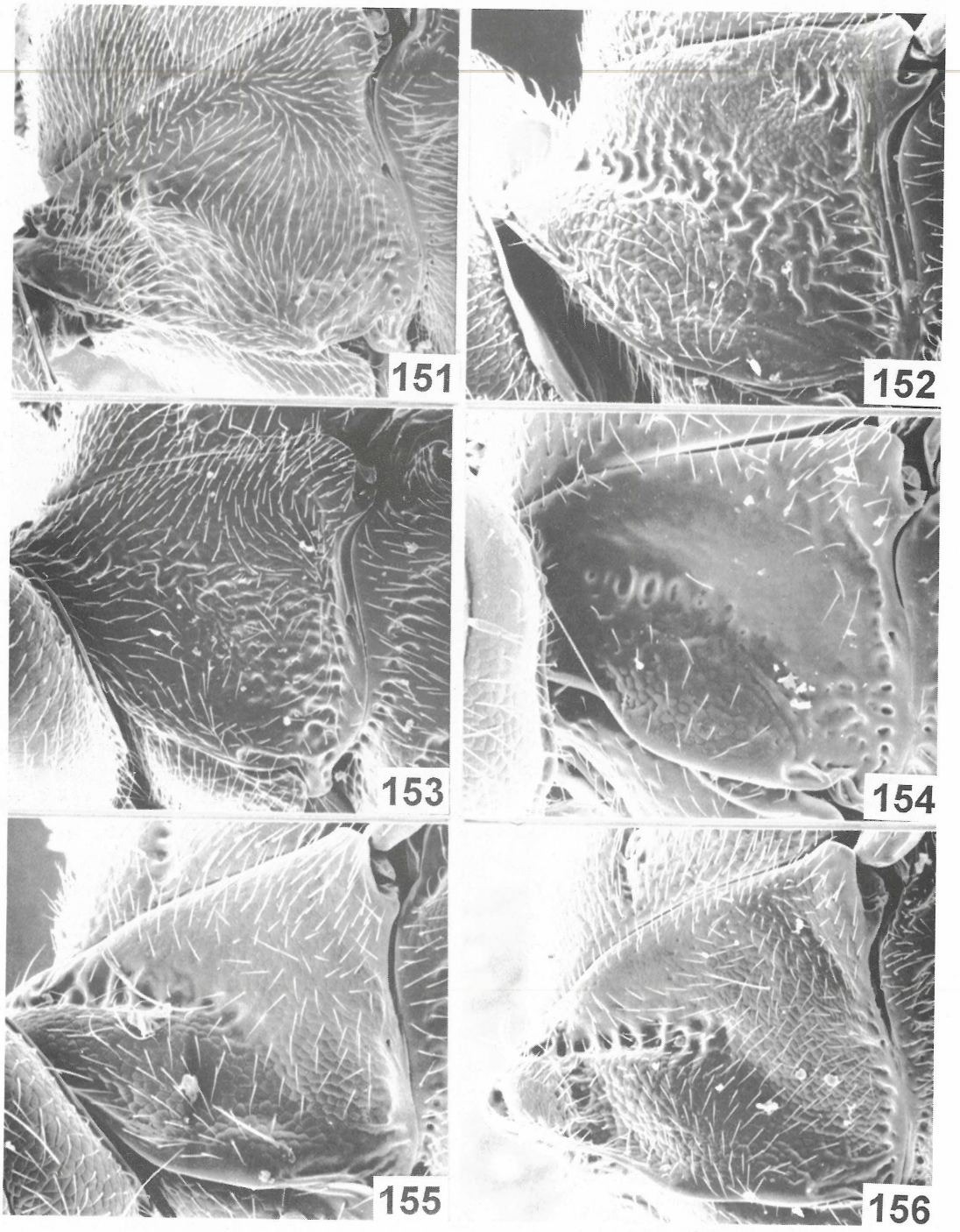
Figs. 131–135. Dorsal view of second and third metasomal terga of *Orgilus* spp. ♀ : 131, *galbinus* sp. n.; 132, *cretus* sp. n.; 133, *lini* sp. n.; 134, *caritus* sp. n.; 135, *meifengensis* sp. n.

Figs. 136–140. Metacoxae of *Orgilus* spp. ♀(except 138, 139♂) : 136, *caballus* sp. n.; 137, *parapappianus* sp. n.; 138, *ischnus* Marshall, 139, *planus* sp. n.; 140, *taiwanensis* sp. n.



Figs. 141–148. Metacoxae of *Orgilus* spp. ♀ : 141, *cunctus* sp. n.; 142, *improcerus* sp. n.; 143, *rarus* sp. n.; 144, *galbinus* sp. n.; 145, *cretus* sp. n.; 146, *lini* sp. n.; 147, *caritus* sp. n.; 148, *meifengensis* sp. n.

Figs. 149–150. Lateral view of pronota of *Orgilus* spp.: 149, *amplissimus* sp. n. ♀ ; 150, *planus* sp. n. ♂.



Figs. 151–156. Lateral view of pronota of *Orgilus* spp. ♀(except 152♂) : 151, ***caballus*** sp. n.; 152, *ischnus* Marshall; 153, *taiwanensis* sp. n.; 154, *cunctus* sp. n.; 155, ***galbinus*** sp. n.; 156, *caritus* sp. n.

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臺灣小繭蜂科（膜翅目）之分類
V. 折脈繭蜂亞科與怒繭蜂亞科[1]

周 樑 鎰[2]

摘 要

折脈繭蜂亞科（Cardiochilinae ）與怒繭蜂亞科（Orgilinae）隸膜翅目、小繭蜂科，乃鱗翅目昆蟲之天敵。本文記錄臺灣 5 種折脈繭蜂與18種怒繭蜂；其中有14新種與 2 臺灣新記錄種。文中附分屬與種之檢索表，及形質圖。

關鍵詞：折脈繭蜂亞科、怒繭蜂亞科、小繭蜂科、分類、臺灣。

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